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ANNOUNCEMENT

The twenty-fifth annual conference of the Southern Economic Association will be held on November 11 and 12, 1955 at the Biltmore Hotel, Atlanta, Georgia.

President Ernst W. Swanson has appointed the Nominating Committee for the 1956 officers of the Southern Economic Association. It consists of Frank T. de Vyver, Duke University, Chairman; William H. Nicholls, Vanderbilt University; and James W. Sweeny, Georgia Institute of Technology. Members are invited to suggest names to this committee.

Howard R. Smith
Secretary

John B. Woolley

ELEVENTH PRESIDENT OF THE SOUTHERN ECONOMIC ASSOCIATION, 1939–1940

(Correction: The April, 1955 issue of this Journal, in which appears the photograph of Dean Robert H. Tucker, of Washington and Lee University, failed to carry the legend that he was the Tenth President of the Southern Economic Association, during 1938–1939.)

VOLUME XXII NUMBER 1

The SOUTHERN ECONOMIC JOURNAL

July 1955

THE PROBLEM OF VERIFICATION IN ECONOMICS*

FRITZ MACHLUP

The Johns Hopkins University

I

It will be well for us first to clear the ground lest we get lost in the rubble of past discussions. To clear the ground is, above all, to come to a decision as to what we mean by verification and what it can and cannot do for our research and analysis.

The Meaning of Verification

A good book of synonyms will have the verb "verify" associated with the more pretentious verbs "prove," "demonstrate," "establish," "ascertain," "confirm," and with the more modest verbs "check" and "test." The verbs in the former group would usually be followed by a "that"—"we shall prove that . . ."—the verbs in the latter group by a "whether"—"we shall check whether. . . ." Besides this difference between "verify that" and "verify whether," there is the difference between verification as a process and verification as an affirmative result of that process. By using "*test*" for the former and "*confirmation*" for the latter we may avoid confusion. Where the distinction is not necessary, "verification" is an appropriate weasel-word, meaning both test and confirmation.

Verification in research and analysis may refer to many things including the correctness of mathematical and logical arguments, the applicability of formulas and equations, the trustworthiness of reports, the authenticity of documents, the genuineness of artifacts or relics, the adequacy of reproductions, translations and paraphrases, the accuracy of historical and statistical accounts, the corroboration of reported events, the completeness in the enumeration of circumstances in a concrete situation, the reliability and exactness of observations, the reproducibility of experiments, the explanatory or predictive value of generalizations. For each of these pursuits, the term verification is used in various disciplines. But we intend to confine ourselves to the last one mentioned: the verification of the explanatory or predictive value of hypothetical generalizations.

Although definitions are sometimes a nuisance rather than an aid, I shall try my hand at one, and say that verification in the sense most relevant to us—the

* A paper presented at the Annual Conference of the Southern Economic Association in Biloxi, Mississippi, on November 19, 1954. The author is indebted to several of his colleagues, but chiefly to Dr. Edith Penrose, for criticism and suggestions leading to improvements of style and exposition.

testing of generalizations—*is a procedure designed to find out whether a set of data of observation about a class of phenomena is obtainable and can be reconciled with a particular set of hypothetical generalizations about this class of phenomena.*

Truth and Reality

I have carefully avoided the words "truth" and "reality," although the Latin *veritas* forms the root of the term defined. I eschewed references to truth and reality in order to stay out of strictly epistemological and ontological controversies. Not that such discussions would be uninteresting or unimportant; he who never studies metaphysical questions, and even prides himself on his unconcern with metaphysics, often does not know how much in fact he talks about it. To stay away from metaphysics one has to know a good bit about it.

The function of words chosen—testing, checking, confirming—is precisely to enable us to leave the concepts of truth and reality in the background. If I should slip occasionally and say that a proposition is "true" or a phenomenon is "real," this should be taken merely as an unguarded way of speaking; for I mean to say only that there seems to be considerable "support" or "evidence" for the proposition in view of a marked *correspondence* or consistency between that proposition and statements about particular observations.

Special and General Hypotheses

My definition of verification related only to hypothetical generalizations. But the status of *special hypotheses about single events or unique situations* (and their causes, effects, and interrelations) also calls for examination, for it is with these that economic history and most of applied economics are concerned. Such special hypotheses—to establish the "facts"—are of course also subject to verification, but the rules and techniques are somewhat different from those of the verification of general hypotheses.

In a murder case we ask "who done it?" and the answer requires the weighing of several alternative special hypotheses. Such special hypotheses may be mental constructions of unobserved occurrences which could have taken place in conjunction with occurrences observed or conclusively inferred. It is an accepted rule that a special hypothesis will be rejected if it is contradicted by a single inconsistency between a firmly established observation and any of the things that follow logically from the combination of the special hypothesis and the factual assumptions of the argument.

But this weighing and testing of special hypotheses in the light of the known circumstances of the case always involves numerous *general* hypotheses. For example, the generalization that "if a man is at one place he cannot at the same time be at another place" may be of utmost importance in verifying a suspicion that Mr. X was the murderer. And whenever observations have to be interpreted and special hypotheses applied to reach a conclusion about what are the "concrete facts," the argument will presuppose the acceptance of numerous general theories or hypotheses linking two or more (observed or inferred) "facts" as possible (or probable) causes and effects. This is the reason why it has to be said

over and over again that most of the facts of history are based on previously formed general hypotheses or theories. Although this has been an important theme in the discussion of the relation between theory and history, and one of the central issues in the *Methodenstreit* in economics, it is not an issue in our discussion today. At the moment we are concerned with the verification of general hypotheses and theories, not of propositions concerning individual events or conditions at a particular time and place. But this much ought to be said here: to establish or verify "historical facts," we must rely on the acceptance of numerous general hypotheses (theories); and to verify general hypotheses we must rely on the acceptance of numerous data representing "facts" observed or inferred at various times and places. We always must take something for granted, no matter how averse we are to "preconceptions."

Theories, Hypotheses, Hunches, Assumptions, Postulates

No fixed lines can be drawn between theories, hypotheses, and mere hunches, the differences being at best those of degree. There are degrees of vagueness in formulation, degrees of confidence or strength of belief in what is posed or stated, degrees of acceptance among experts, and degrees of comprehensiveness or range of applicability.[1]

A hunch is usually vague, sometimes novel, original, often incompletely formulated; perhaps more tentative than a hypothesis, although the difference may lie just in the modesty of the analyst. A hypothesis may likewise be very tentative; indeed, some hypotheses are introduced only for didactic purposes, as provisional steps in an argument, in full knowledge of their inapplicability to any concrete situation and perhaps in preparation for a preferred hypothesis. Distinctions between hypotheses and theories have been suggested in terms of the strength of belief in their applicability or of the comprehensiveness (range) of their applicability.[2] But so often are the words theory and hypothesis used interchangeably that there is not much point in laboring any distinguishing criteria.

Perhaps it should be stressed that every hypothesis may have the status of an "assumption" in a logical argument. An assumption of a rather general nature which is posited as a "principle" for an argument or for a whole system

[1] The belief that a "hunch" is something fundamentally different from a "theory" may be responsible for certain antitheoretical positions of some historians and statisticians. Those who claimed the priority and supremacy of fact-finding over "theoretical speculation" might have accepted the contention that you cannot find facts without having some hunch. But this is practically all that the theorists meant when they claimed that theory must precede fact-finding, whether historical or statistical, and that history without theory, and measurement without theory are *impossible*. There are kinds of fact-finding which presuppose full-fledged theories; some simpler kinds may start with vague hunches.

[2] "A hypothesis is an assumption . . . tentatively suggested as an explanation of a phenomenon." Morris R. Cohen and Ernest Nagel, *An Introduction to Logic and Scientific Method* (New York: Harcourt, Brace, 1938), p. 205.—"A hypothesis . . . is . . . a theory which has, at present at least, a limited range of application. It is promoted to the status of a theory if and when its range is deemed sufficiently large to justify this more commendatory appelation." Henry Margenau, "Methodology of Modern Physics," *Philosophy of Science*, Vol. II (January 1935), p. 67.

of thought, but is neither self-evident nor proved, is often called a "postulate." Just as there may be a connotation of tentativeness in the word "hypothesis," there may be a connotation of arbitrariness in the word "postulate."[3] But since no fundamental assumption in an empirical discipline is definitive, and since all are more or less arbitrary, it is useless to insist on subtle distinctions which are (for good reasons) disregarded by most participants in the discussion.[4]

Confirmation versus Non-Disconfirmation

How is a hypothesis verified? The hypothesis is *tested* by a two-step procedure: first deducing from it and the factual assumptions with which it is combined all the conclusions that can be inferred, and second, confronting these conclusions with data obtained from observation of the phenomena concerned. The hypothesis is *confirmed* if reasonable correspondence is found between the deduced and the observed, or more correctly, if no irreconcilable contradiction is found between the deduced and the observed. Absence of contradictory evidence, a finding of non-contradiction, is really a negation of a negation: indeed, one calls a hypothesis "confirmed" when it is merely *not disconfirmed*.

Thus, the procedure of verification may yield findings compelling the rejection of the tested hypothesis, but never findings that can "prove" its correctness, adequacy or applicability.[5] As in a continuing sports championship conducted by elimination rules, where the winner stays in the game as long as he is not defeated but can always be challenged for another contest, no empirical hypothesis is safe forever; it can always be challenged for another test and may be knocked out at any time. The test results, at best, in a "confirmation till next time."

Several logicians use the word "falsification" for a finding of irreconcilable contradiction; and since a hypothesis can be definitely refuted or "falsified," but not definitely confirmed or "verified," some logicians have urged that we speak only of "falsifiable," not of verifiable propositions. Because the word "falsification" has a double meaning, I prefer to speak of refutation or disconfirmation. But the dictum is surely right: testing an empirical hypothesis results either in its disconfirmation or its non-disconfirmation, never in its definitive confirmation.

[3] *Cf.* Wayne A. Leeman, "The Status of Facts in Economic Thought," *The Journal of Philosophy*, Vol. XLVII (June 1951), p. 408.—Leeman suggests that economists prefer the term "assumption" because it "escapes . . . the undesirable connotations" of the terms "hypothesis" and "postulate."

[4] "So far as our present argument is concerned, the things (propositions) that we take for granted may be called indiscriminately either hypotheses or axioms or postulates or assumptions or even principles, and the things (propositions) that we think we have established by admissible procedure are called theorems." Joseph A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), p. 15.

[5] There are no rules of verification "that can be relied on in the last resort. Take the most important rules of experimental verification: reproducibility of results; agreement between determinations made by different and independent methods; fulfillment of predictions. These are powerful criteria, but I could give you examples in which they were all fulfilled and yet the statement which they seemed to confirm later turned out to be false. The most striking agreement with experiment may occasionally be revealed later to be based on mere coincidence. . . ." Michael Polanyi, *Science, Faith and Society* (London: Cumberlege, 1946), p. 13.

Even if a definitive confirmation is never possible, the number of tests which a hypothesis has survived in good shape will have a bearing on the confidence people have in its "correctness." A hypothesis confirmed and re-confirmed any number of times will have a more loyal following than one only rarely exposed to the test of experience. But the strength of belief in a hypothesis depends, even more than on any direct empirical tests that it may have survived, on the place it holds within a hierarchical system of inter-related hypotheses. But this is another matter, to be discussed a little later.

Nothing that I have said thus far would, I believe, be objected to by any modern logician, philosopher of science, or scientist. While all points mentioned were once controversial, the combat has moved on to other issues, and only a few stragglers and latecomers on the battlefield of methodology mistake the rubble left from long ago for the marks of present fighting. So we shall move on to issues on which controversy continues.

II

Which kinds of propositions can be verified, and which cannot? May unverified and unverifiable propositions be legitimately retained in a scientific system? Or should all scientific propositions be verified or at least verifiable? These are among the controversial issues—though my own views are so decided that I cannot see how intelligent people can still quarrel about them, and I have come to believe that all good men think as I do, and only a few misguided creatures think otherwise. But I shall restrain my convictions for a while.

Critizing extreme positions is a safe pastime because one may be sure of the support of a majority. But it is not for this reason but for the sake of a clear exposition that I begin with the presentation of the positions which *extreme apriorism*, on the one side, and *ultra-empiricism*, on the other side, take concerning the problem of verification in economics.

Pure, Exact, and Aprioristic Economics

Writers on the one side of this issue contend that economic science is a system of *a priori* truths, a product of pure reason,[6] an exact science reaching laws as universal as those of mathematics,[7] a purely axiomatic discipline,[8] a system of pure deductions from a series of postulates,[9] not open to any verification or refutation on the ground of experience.[10]

[6] "The ultimate yardstick of an economic theorem's correctness or incorrectness is solely reason unaided by experience." Ludwig von Mises, *Human Action: A Treatise on Economics* (New Haven: Yale University Press, 1949), p. 858.

[7] "There is a science of economics, a true and even exact science, which reaches laws as universal as those of mathematics and mechanics." Frank H. Knight, "The Limitations of Scientific Method in Economics," in R. G. Tugwell, ed., *The Trend of Economics* (New York: Crofts, 1930), p. 256.

[8] "Economic theory is an axiomatic discipline. . . ." Max Weber, *On the Methodology of the Social Sciences* (Glencoe, Ill.: Free Press, 1949), p. 43.

[9] "Economic analysis . . . consists of deductions from a series of postulates. . . ." Lionel Robbins, *An Essay on the Nature and Significance of Economic Science* (London: Macmillan, 2nd ed., 1935), p. 99.

[10] "What assigns economics its peculiar and unique position in the orbit of pure knowl-

We must not attribute to all writers whose statements were here quoted or paraphrased the same epistemological views. While for Mises, for example, even the fundamental postulates are *a priori* truths, necessities of thinking,[11] for Robbins they are "assumptions involving in some way simple and indisputable facts of experience."[12] But most of the experience in point is not capable of being recorded from external (objective) observation; instead, it is immediate, inner experience. Hence, if verification is recognized only where the test involves objective sense-experience, the chief assumptions of economics, even if "empirical," are not independently verifiable propositions.

This methodological position, either asserting an *a priori* character of all propositions of economic theory or at least denying the independent objective verifiability of the fundamental assumptions, had been vigorously stated in the last century by Senior[13] and Cairnes,[14] but in essential respects it goes back to John Stuart Mill.

Mill, the great master and expositor of inductive logic, had this to say on the method of investigation in political economy:

> Since . . . it is vain to hope that truth can be arrived at, either in Political Economy or in any other department of the social science, while we look at the facts in the concrete, clothed in all the complexity with which nature has surrounded them, and endeavor to elicit a general law by a process of induction from a comparison of details; there remains no other method than the *a priori* one, or that of 'abstract speculation.'[15]
>
> By the method *a priori* we mean . . . reasoning from an assumed hypothesis; which is not a practice confined to mathematics, but is of the essence of all science which admits of general reasoning at all. To verify the hypothesis itself *a posteriori*, that is, to examine whether the facts of any actual case are in accordance with it, is no part of the business of science at all but of the *application* of science.[16]

This does not mean that Mill rejects attempts to verify the results of economic analysis; on the contrary,

> We cannot . . . too carefully endeavor to verify our theory, by comparing, in the particular cases to which we have access, the results which it would have led us to predict, with the most trustworthy accounts we can obtain of those which have been actually realized.[17]

---

edge and of the practical utilization of knowledge is the fact that its particular theorems are not open to any verification or falsification on the ground of experience." Ludwig von Mises, *op. cit.*, p. 858.

[11] Ludwig von Mises, *op. cit.*, p. 33.

[12] Lionel Robbins, *op. cit.*, p. 78, also pp. 99–100.

[13] Nassau William Senior, *Political Economy* (London: Griffin, 3rd ed., 1854), pp. 5, 26–29.

[14] John E. Cairnes, *The Character and Logical Method of Political Economy* (London: Macmillan, 1875), especially pp. 74–85, 99–100.

[15] John Stuart Mill, "On the Definition of Political Economy; and on the Method of Investigation Proper to It" in *Essays on Some Unsettled Questions of Political Economy* (London, 1844, reprinted London School of Economics, 1948), pp. 148–49.

[16] *Ibid.*, p. 143.

[17] *Ibid.*, p. 154.

The point to emphasize is that Mill does not propose to put the *assumptions* of economic theory to empirical tests, but only the *predicted results that are deduced from them*. And this, I submit, is what all the proponents of pure, exact, or aprioristic economic theory had in mind, however provocative their contentions sounded.[18] Their objection was to verifying the basic assumptions in isolation.

Ultra-Empirical Economics

Opposed to these tenets are the ultra-empiricists. "Empiricist" is a word of praise to some, a word of abuse to others. This is due to the fact that there are many degrees of empiricism. Some economists regard themselves as "empiricists" merely because they oppose radical apriorism and stress the dependence of theory on experience (in the widest sense of the word); others, because they demand that the results deduced with the aid of theory be compared with observational data whenever possible; others, because they are themselves chiefly concerned with the interpretation of data, with the testing of hypotheses and with the estimates of factual relationships; others, because they are themselves engaged in the collection of data or perhaps even in "field" work designed to produce "raw" data; others, because they refuse to recognize the legitimacy of employing at any level of analysis propositions not independently verifiable. It is the last group which I call the ultra-empiricists.[19] Then there are the ultra-ultra-empiricists who go even further and insist on independent verification of all assumptions by objective data obtained through sense observation.

The ultra-empiricist position is most sharply reflected in the many attacks on the "assumptions" of economic theory. These assumptions are decried as unverified, unverifiable, imaginary, unrealistic. And the hypothetico-deductive system built upon the unrealistic or unverifiable assumptions is condemned either as deceptive or as devoid of empirical content,[20] without predictive or

[18] "Aprioristic reasoning is purely conceptual and deductive. It cannot produce anything else but tautologies and analytic judgments." While this sounds like an "empiricist's" criticism of the aprioristic position, it is in fact a statement by Mises. (*Op. cit.*, p. 38.) Mises emphasizes that "the end of science is to know reality," and that "in introducing assumptions into its reasoning, it satisfies itself that the treatment of the assumptions concerned can render useful services for the comprehension of reality." (*Ibid.*, pp. 65–66.) And he stresses that the choice of assumptions is directed by experience.

[19] It is in this last meaning that empiricisms has usually been discussed and criticized in philosophy. In the words of William James, radical empiricism "must neither admit into its constructions any element that is not directly experienced, nor exclude from them any element that is directly experienced. For such a philosophy, *the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as 'real' as anything else in the system.*" William James, *Essays in Radical Empiricism* (New York: Longmans, Green, 1912), pp. 42–43.

[20] "That 'propositions of pure theory' is a name for . . . propositions not conceivably falsifiable empirically and which do not exclude . . . any conceivable occurrence, and which are therefore devoid of empirical content. . . ." T. W. Hutchison, *The Significance and Basic Postulates of Economic Theory* (London: Macmillan, 1938), p. 162.

explanatory significance,[21] without application to problems or data of the real world.[22] Why deceptive? Because from wrong assumptions only wrong conclusions follow. Why without empirical significance? Because, in the words of the logician Wittgenstein, "from a tautology only tautologies follow."[23]

If the ultra-empiricists reject the basic assumptions of economic theory because they are not independently verified, and reject any theoretical system that is built on unverified or unverifiable assumptions, what is the alternative they offer? A program that begins with facts rather than assumptions.[24] What facts? Those obtained "by statistical investigations, questionnaires to consumers and entrepreneurs, the examination of family budgets and the like."[25] It is in research of this sort that the ultra-empiricists see "the only possible scientific method open" to the economist.[26]

This, again, is the essence of the ultra-empiricist position on verification: the ultra-empiricist is so distrustful of deductive systems of thought that he is not satisfied with the indirect verification of hypotheses, that is, with tests showing that the results deduced (from these hypotheses and certain factual assumptions) are in approximate correspondence with reliable observational data; instead, he insists on the independent verification of all the assumptions, hypothetical as well as factual, perhaps even of each intermediate step in the analysis. To him "testable" means "directly testable by objective data obtained by sense observation," and propositions which are in this sense "non-testable" are detestable to him.

The Testability of Fundamental Assumptions

The error in the antitheoretical empiricist position lies in the failure to see the difference between *fundamental* (heuristic) hypotheses, which are not inde-

[21] ". . . that propositions of pure theory, by themselves, have no prognostic value or 'causal significance.' " T. W. Hutchison, *op. cit.*, p. 162.—The clause "by themselves" makes Hutchison's statement unassailable, because nothing at all has causal significance by itself; only in conjunction with other things can anything have causal significance. But if Hutchison's statement means anything, it means an attack against the use of empirically unverifiable propositions in economic theory, regardless of their conjunction with other propositions. Indeed, he states that "a proposition which can never *conceivably* be shown to be true or false . . . can *never* be of any use to a scientist" (*ibid.*, pp. 152–53).

[22] With regard to the "fundamental assumption" of economic theory concerning "subjectively rational" and "maximizing" behavior, Hutchison states that "the empirical content of the assumption and all the conclusions will be the same—that is, nothing." *Ibid.*, p. 116.

[23] Ludwig Wittgenstein, *Tractatus Logico-Philosophicus* (London: Routledge & Kegan Paul, 1951), p. 167.

[24] ". . . if one wants to get beyond a certain high level of abstraction one has to begin more or less from the beginning with extensive empirical investigation." T. W. Hutchison, *op. cit.*, p. 166.

[25] *Ibid.*, p. 120. This does not answer the question: "what facts?" Precisely what data should be obtained and statistically investigated? What questions asked of consumers and entrepreneurs?

[26] *Ibid.*, p. 120. I could have quoted from dozens of critics of economic theory, from adherents of the historical, institutional, quantitative schools, and these quotations might be even more aggressive. I have selected Hutchison because he is the critic best informed about logic and scientific method.

pendently testable, and *specific* (factual) assumptions, which are supposed to correspond to observed facts or conditions; or the differences between hypotheses on different levels of generality and, hence, of different degrees of testability.

The fundamental hypotheses are also called by several other names, some of which convey a better idea of their methodological status: "heuristic principles" (because they serve as useful guides in the analysis), "basic postulates" (because they are not to be challenged for the time being), "useful fictions" (because they need not conform to "facts" but only be useful in "as if" reasoning), "procedural rules" (because they are resolutions about the analytical procedure to be followed), "definitional assumptions" (because they are treated like purely analytical conventions).

A fundamental hypothesis serves to bring together under a common principle of explanation vast numbers of very diverse observations, masses of data of apparently very different sort, phenomena that would otherwise seem to have nothing in common. Problems like the explanation of the movements in wages in 13th and 14th century Europe, of the prices of spices in 16th century Venice, of the effects of the capital flows to Argentina in the 19th century, of the consequences of German reparation payments and of the devaluation of the dollar in the 1930's; problems like the prediction of effects of the new American quota on Swiss watches, of the new tax laws, of the increase in minimum wage rates, and so forth,—problems of such dissimilarity can all be tackled by the use of the same fundamental hypotheses. If these hypotheses are successful in this task and give more satisfactory results than other modes of treatment could, then we accept them and stick by them as long as there is nothing better—which may be forever.

That there is no way of subjecting fundamental assumptions to independent verification should be no cause of disturbance. It does not disturb the workers in the discipline which most social scientists so greatly respect and envy for its opportunities of verification: physical science. The whole system of physical mechanics rests on such fundamental assumptions: Newton's three laws of motion are postulates or procedural rules for which no experimental verification is possible or required; and, as Einstein put it, "No one of the assumptions can be isolated for separate testing." For, he went on to say, "physical concepts are free creations of the human mind, and are not, however it may seem, uniquely determined by the external world."[27]

Much has been written about the meaning of "explanation." Some have said that the mere *description* of regularities in the co-existence and co-variation of observed phenomena is all we can do and will be accepted as an *explanation* when we are sufficiently used to the regularities described.[28] There is something to this view; but mere resignation to the fact that "it always has been so" will not for long pass as explanation for searching minds. The feeling of relief and satisfied curiosity—often expressed in the joyous exclamation "ah haahh!"—comes to most analysts only when the observed regularities can be deduced from

[27] Albert Einstein and Leopold Infeld, *The Evolution of Physics* (New York: Simon and Schuster, 1938), p. 33.

[28] Cf. P. W. Bridgman, *The Logic of Modern Physics* (New York: Macmillan, 1927), p. 43.

general principles which are also the starting point—foundation or apex, as you like—of many other chains of causal derivation. This is why Margenau, another physicist, said that an explanation involves a "progression into the constructional domain. We explain by going 'beyond phenomena.' "[29] But this clearly implies that the explanatory general assumptions cannot be empirically verifiable in isolation.

Logicians and philosophers of science have long tried to make this perfectly clear. Although appeals to authority are ordinarily resorted to only where an expositor has failed to convince his audience, I cannot resist the temptation to quote two authorities on my subject. Here is how the American philosopher Josiah Royce put it:

> One often meets with the remark that a scientific hypothesis must be such as to be more or less completely capable of verification or of refutation by experience. The remark is sound. But equally sound it is to say that a hypothesis which, just as it is made, is, without further deductive reasoning, capable of receiving direct refutation or verification, *is not nearly as valuable to any science as is a hypothesis whose verifications, so far as they occur at all, are only possible indirectly, and through the mediation of a considerable deductive theory*, whereby the consequences of the hypothesis are first worked out, and then submitted to test.[30]

And here is the same idea in the words of the British philosopher of science, Richard B. Braithwaite:

> For science, as it advances, does not rest content with establishing simple generalizations from observable facts. It tries to explain these lowest-level generalization by deducing them from more general hypotheses at a higher level. . . . As the hierarchy of hypotheses of increasing generality rises, the concepts with which the hypotheses are concerned cease to be properties of things which are directly observable, and instead become 'theoretical' concepts—atoms, electrons, fields of force, genes, unconscious mental processes—which are connected to the observable facts by complicated logical relationships.[31]

And he states that "the empirical testing of the deductive system is effected by testing the lowest-level hypotheses in the system."[32]

Assumptions in Economics, Pure and Applied

Examples of *fundamental assumptions* or "high-level generalizations" in economic theory are that people act rationally, try to make the most of their opportunities, and are able to arrange their preferences in a consistent order; that entrepreneurs prefer more profit to less profit with equal risk.[33] These are

[29] Henry Margenau, *The Nature of Physical Reality* (New York: McGraw-Hill, 1950), p. 169.

[30] Josiah Royce, "The Principles of Logic," in *Logic, Encyclopaedia of the Philosophical Sciences*, Vol. I (London: Macmillan, 1913), pp. 88–89.

[31] Richard Bevan Braithwaite, *Scientific Explanation: A Study of the Function of Theory, Probability and Law in Science* (Cambridge: University Press, 1953), p. ix.

[32] *Ibid.*, p. 13.

[33] For most problems of an enterprise economy no exact specifications about "profit"

assumptions which, though empirically meaningful, require no independent empirical tests but may be significant steps in arguments reaching conclusions which are empirically testable.

Examples of *specific assumptions* are that the expenditures for table salt are a small portion of most households' annual budgets; that the member banks are holding very large excess reserves with the Federal Reserve Banks; that there is a quota for the importation of sugar which is fully utilized. Examples of *deduced "low-level hypotheses"* are that a reduction in the price of table salt will not result in a proportionate increase in salt consumption; that a reduction in the discount rates of the Federal Reserve Banks will at such times not result in an increase in the member banks' lending activities; that a reduction in sugar prices abroad will not result in a reduction of domestic sugar prices. All these and similar specific assumptions and low-level hypotheses are empirically testable.

Perhaps a few additional comments should be made concerning the fundamental assumptions, particularly the postulate of rational action, the "economic principle" of aiming at the attainment of a maximum of given ends. Any independent test of this assumption by reference to objective *sense*-experience is obviously impossible. Those who accept findings of introspection as sufficient evidence may contend that the fundamental assumption can be, and constantly is, verified. Those who accept findings of interrogation (that is, replies to questions put to large numbers of introspectors) as "objective" evidence may contend that the assumption of "maximizing behavior" is independently testable. But such a test would be gratuitous, if not misleading. For the fundamental assumption may be understood as an idealization with constructs so far removed from operational concepts that contradiction by testimony is ruled out; or even as a complete fiction with only one claim: that reasoning *as if* it were realized is helpful in the interpretation of observations.[34]

Economists who are still suspicious of non-verifiable assumptions, and worry about the legitimacy of using them, may be reassured by this admission: The fact that fundamental assumptions are not directly testable and cannot be refuted by empirical investigation does not mean that they are beyond the pale of the so-called "principle of permanent control," that is, beyond possible challenge, modification or rejection. These assumptions may well be rejected, but only together with the theoretical system of which they are a part, and only when a more satisfactory system is put in its place; in Conant's words, "a theory is only overthrown by a better theory, never merely by contradictory facts."[35]

(whose? for what period? how uncertain? etc.) will be needed. There are some special problems for which "specific assumptions" concerning profit are needed. Needless to say, the assumption about entrepreneurs will be irrelevant for problems of centrally directed economies.

[34] Or, again in a different formulation: the fundamental assumption is a resolution to proceed in the interpretation of all data of observation as if they were the result of the postulated type of behavior.

[35] James B. Conant, *On Understanding Science* (New Haven: Yale University Press, 1947), p. 36.

III

What I have said and quoted about assumptions and hypotheses on various "levels" of abstraction may itself be too abstract, too remote from our ordinary terms of discourse, to be meaningful to many of us. Perhaps it will be helpful to try a graphical presentation of a simple model of an analytical system combining assumptions of various types.

A Model of an Analytical Apparatus

The design for the model was suggested by the usual metaphors about an analytical "apparatus," "machine," or "engine of pure theory." Something goes into a machine and something comes out. In this case the input is an assumption concerning some "change" occurring and causing other things to happen, and the output is the "Deduced Change," the conclusion of the (mental) operation. The machine with all its parts furnishes the connection between the "assumed cause," the input, and the "deduced effect," the outcome. The main point of this model is that *the machine is a construction of our mind, while the assumed and deduced changes should correspond to observed phenomena, to data of observation, if the machine is to serve as an instrument of explanation or prediction.* In explanations the analytical machine helps select an adequate "cause" for an observed change; in predictions it helps find a probable "effect" of an observed change.[11]

The machine consists of many parts, all of which represent assumptions or hypotheses of different degrees of generality. The so-called *fundamental assumptions* are a fixed part of the machine; they make the machine what it is; they cannot be changed without changing the character of the entire machine. All other parts are exchangeable, like coils, relays, spools, wires, tapes, cylinders, records, or mats, something that can be selected and put in, and again taken out to be replaced by a different piece of the set. These exchangeable parts represent *assumptions about the conditions* under which the Assumed Change must operate. Some of the parts are exchanged all the time, some less frequently, some only seldom. Parts of type A, the Assumed Conditions as to "type of case," are most frequently exchanged. Parts of type B, the Assumed Conditions as to "type of setting," will stay in the machine for a longer time and there need be less variety in the set from which they are selected. Parts of type C, the Assumed Conditions as to "type of economy," are least exchangeable, and there will be only a small assortment of alternative pieces to choose from.

Now we shall leave the engineering analogies aside and discuss the status of all these assumptions regarding the operational and observational possibilities and the requirements of verification.

Verified Changes under Unverified Conditions

Both the Assumed Change and the Deduced Change should be empirically verifiable through correspondence with data of observation. At least one of the two has to be verifiable if the analysis is to be applied to concrete cases. Hence

[11] On the problem of prediction versus explanation see the chapter on "Economic Fact and Theory" in my book *The Political Economy of Monopoly* (Baltimore: Johns Hopkins Press, 1952), pp. 455 ff.

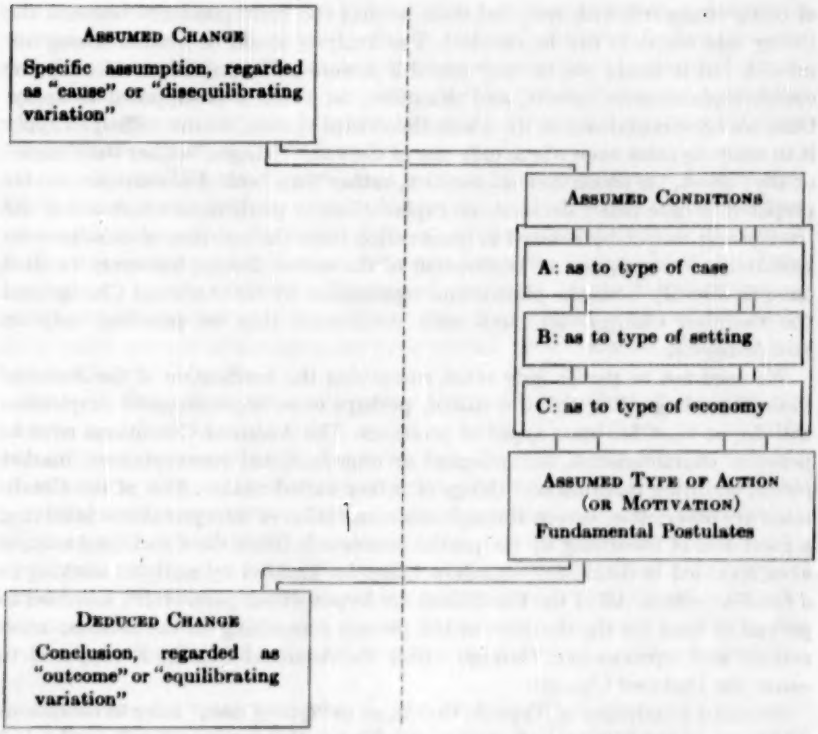
ASSUMED CHANGE
Specific assumption, regarded as "cause" or "disequilibrating variation"
ASSUMED CONDITIONS
A: as to type of case
B: as to type of setting
C: as to type of economy
ASSUMED TYPE OF ACTION (OR MOTIVATION)
Fundamental Postulates
DEDUCED CHANGE
Conclusion, regarded as "outcome" or "equilibrating variation"

FIG. 1. A MODEL OF THE USE OF AN ANALYTICAL APPARATUS

On the right side is the "machine of pure theory," a mental *construction* for heuristic purposes; on the left side are assumptions of independent and dependent variables whose *correspondence* with data of observation may be tested.

the concepts employed to describe the changes should, if possible, be operational. This raises no difficulty in the case of most kinds of *Assumed Change* in whose effects we are interested, for example: changes in tax rates, customs duties, foreign-exchange rates, wage rates, price supports, price ceilings, discount rates, open-market policies, credit lines, government expenditures, agricultural crops—matters covered in reports and records. There are difficulties concerning some other kinds of Assumed Change, such as improvements in technology, greater optimism, changed tastes for particular goods—things for which recorded data are often unavailable. As regards the *Deduced Change* the requirement that it be operational will usually be met, because we are interested chiefly in effects upon prices, output, income, employment, etc.,—magnitudes reported in statistical series of some sort. To be sure, the figures may be unreliable and the statistical concepts may not be exact counterparts to the analytical concepts, but we cannot be too fussy and must be satisfied with what we can get.

In principle we want both Assumed Change and Deduced Change to be capable

of being compared with recorded data so that the correspondence between the theory and the data can be checked. The analysis would be neither wrong nor invalid, but it would not be very useful if it were never possible to identify the concrete phenomena, events, and situations, to which it is supposed to apply. Once we have confidence in the whole theoretical system, we are willing to apply it to concrete cases even where only one of the two "changes," either the "cause" or the "effect," is identifiable in practice, rather than both. For example, we are prepared to base policy decisions on explanations or predictions where one of the phenomena cannot be isolated in observation from the complex of simultaneous variations. For purposes of verification of the entire theory, however, we shall have to identify both the phenomena represented by the Assumed Change and the Deduced Change—although such verification may be practical only on rare occasions.

We need not be particularly strict concerning the verification of the *Assumed Conditions*. Regarding them, a casual, perhaps even impressionistic empiricism will do, at least for most types of problems. The Assumed Conditions refer to personal characteristics, technological or organizational circumstances, market forms, enduring institutions—things of rather varied nature. Few of the Conditions are observable, except through communication of interpretations involving a good deal of theorizing by the parties concerned. Often the Conditions are not even specified in detail, but somehow taken for granted by analysts working in a familiar milieu. All of the Conditions are hypothetical parameters, assumed to prevail at least for the duration of the process comprising all the actions, interactions and repercussions through which the Assumed Change is supposed to cause the Deduced Change.

Assumed Conditions of Type A, that is, as to *"type of case,"* refer to conditions which may vary from case to case and influence the outcome significantly, but are sufficiently common to justify the construction of "types" for theoretical analysis. Here is a list of examples: type of goods involved (durable, non-durable, perishable; inferior, non-inferior; taking up substantial or negligible parts of buyer's budget; substitutable, complementary; etc.); cost conditions (marginal cost decreasing, constant, increasing; joint costs, etc.); elasticity of supply or demand (positive, negative, relatively large, unity, less than unity); market position (perfect, imperfect polypoly; collusive, uncoordinated oligopoly; perfect, imperfect monopoly); entry (perfect, imperfect pliopoly); expectations (elastic, inelastic; bullish, bearish; certain, uncertain); consumption propensity (greater, smaller than unity); elasticity of liquidity preference (infinite, less than infinite, zero).

Assumed Conditions of Type B, that is, as to "type of setting," refer to conditions which may change over brief periods of time—say, with a change of government or of the political situation, or during the business cycle—and are apt to influence the outcome in definite directions. A list of examples will indicate what is meant by conditions prevailing under the current "setting": general business outlook (boom spirit, depression pessimism); bank credit availability (banks loaned up, large excess reserves); central bank policy (ready to monetize

government securities, determined to maintain easy money policy, willing to let interest rates rise); fiscal policy (expenditures fixed, adjusted to tax revenues, geared to unemployment figures; tax rates fixed, adjusted to maintain revenue, etc.); farm program (support prices fixed, flexible within limits, etc.); antitrust policy (vigorous prosecution of cartelization, etc.); foreign aid program; stabilization fund rules; trade union policies.

Assumed Conditions of Type C, that is, as to "*type of economy*," refer to conditions which may vary from country to country and over larger periods of time, but may be assumed to be "settled" for a sufficiently large number of cases to justify taking these conditions as constant. Examples include legal and social institutions; private property; freedom of contract; corporation law; patent system; transportation system; enforcement of contracts; ethics of law violations; social customs and usages; monetary system (gold standard, check system, cash holding habits).

Assumed Conditions are exchangeable because the effects of an Assumed Change may have to be analysed under a variety of conditions: for example, with different degrees or forms of competition, different credit policies, different tax structures, different trade union policies, etc. But it may also be expedient, depending on the problem at hand, to regard a variation of an Assumed Condition as an Assumed Change, and *vice versa*. For example, the problem may concern the effects of a wage rate increase under various market conditions or, instead, the effects of a change in market position under conditions of automatic wage escalation; the effects of a change in monetary policy with different tax structure, or the effects of a change in the tax structure under different monetary policies.

After listing the many examples of the various types of Assumed Conditions it will probably be agreed that a rigid verification requirement would be out of place. Usually the judgment of the analyst will suffice even if he cannot support it with more than the most circumstantial evidence or mere "impressions." Suppose he deals with a simple cost-price-output problem in a large industry, how will the analyst determine what "type of case" it is with regard to "market position?" Lacking the relevant information, he may first try to work with a model of perfect polypoly[17]—although he knows well that this cannot fit the real situation—and will note whether his deduced results will be far off the mark. He may find the results reasonably close to the observed data and may leave it at that. For to work with a more "realistic" assumption may call for so many additional assumptions for which no relevant information is available that it is preferable and unobjectionable to continue with a hypothesis contrary to fact. When a simpler hypothesis, though obviously unrealistic, gives consistently

[17] Under perfect polypoly the individual seller assumes that his own supply will not affect any other seller or the market as a whole and, thus, that he could easily sell more at the same price and terms. This condition was also called "pure competition," "perfect competition," or "perfect market" (although it has little to do with any effort of "competing" or with any property of the "market"). See Fritz Machlup, *The Economics of Sellers' Competition* (Baltimore: Johns Hopkins Press, 1952), pp. 85-91, and pp. 116 ff.

satisfactory results, one need not bother with more complicated, more realistic hypotheses.

Ideal Type of Action, Unverified but Understood

While solid empirical verification is indicated for the Assumed Change, and casual empirical judgments are indicated for the Assumed Conditions, the *Assumed Type of Action* forms the fundamental postulates of economic analysis and thus is not subject to a requirement of independent verification.

Various names have been suggested for the fundamental postulates of economic theory: "economic principle," "maximization principle," "assumption of rationality," "law of motivation," and others. And their logical nature has been characterized in various ways: they are regarded as "self-evident propositions," "axioms," "*a priori* truths," "truisms," "tautologies," "definitions," "rigid laws," "rules of procedure," "resolutions," "working hypotheses," "useful fictions," "ideal types," "heuristic mental constructs," "indisputable facts of experience," "facts of immediate experience," "data of introspective observation," "private empirical data," "typical behavior patterns," and so forth.

Some of these characterizations are equivalent to or consistent with each other, but some are not. How can a proposition be both *a priori* and empirical, both a definition and a fact of experience? While this cannot be, the distinctions in this particular instance are so fine that conflicts of interpretation seem unavoidable. Logicians have long debated the possibility of propositions being synthetic and yet *a priori*, and physicists are still not quite agreed whether the "laws" of mechanics are analytical definitions or empirical facts. The late philosopher Felix Kaufmann introduced as a middle category the so-called "rules of procedure," which are neither synthetic in the sense that they are falsifiable by contravening observations nor *a priori* in the sense that they are independent of experience;[38] they are and remain accepted as long as they have heuristic value, but will be rejected in favor of other rules (assumptions) which seem to serve their explanatory functions more successfully.

If this debate has been going on in the natural sciences, how could it be avoided in the social sciences? If issues about "self-evident," "inescapable," or "indisputable" insights arose concerning the physical world, how much more pertinent are such issues in the explanation of human action, where man is both observer and subject of observation! This, indeed, is the essential difference between the natural and the social sciences: that in the latter the facts, the data of "observation," are themselves results of interpretations of human actions by human actors.[39] And this imposes on the social sciences a requirement which does not

[38] Felix Kaufmann, *Methodology of the Social Sciences* (New York: Oxford University Press, 1944), pp. 77 ff, especially pp. 87–88.

[39] ". . . the object, the 'facts' of the social sciences are also opinions—not opinions of the student of the social phenomena, of course, but opinions of those whose actions produce his object. . . . They [the facts] differ from the facts of the physical sciences in being . . . beliefs which are as such our data . . . and which, moreover, we cannot directly observe in the minds of the people but recognize from what they do and say merely because we have

exist in the natural sciences: that all types of action that are used in the abstract models constructed for purposes of analysis be "understandable" to most of us in the sense that we could conceive of sensible men acting (sometimes at least) in the way postulated by the ideal type in question. This is the crux of Max Weber's methodology of the social sciences, and was recently given a refined and most convincing formulation by Alfred Schuetz.[40]

Schuetz promulgates three postulates guiding model construction in the social sciences: the postulates of "logical consistency," of "subjective interpretation," and of "adequacy." The second and third of these postulates are particularly relevant here:

> In order to explain human actions the scientist has to ask what model of an individual mind can be constructed and what typical contents must be attributed to it in order to explain the observed facts as the result of the activity of such a mind in an understandable relation. The compliance with this postulate warrants the possibility of referring all kinds of human action or their result to the subjective meaning such action or result of an action had for the actor.
>
> Each term in a scientific model of human action must be constructed in such a way that a human act performed within the life world by an individual actor in the way indicated by the typical construct would be understandable for the actor himself as well as for his fellowmen in terms of common-sense interpretation of everyday life. Compliance with this postulate warrants the consistency of the constructs of the social scientist with the constructs of common-sense experience of the social reality.[41]

Thus, the fundamental assumptions of economic theory are not subject to a requirement of independent empirical verification, but instead to a requirement of understandability in the sense in which man can understand the actions of fellowmen.[42]

IV

We are ready to summarize our conclusions concerning verification of the assumptions of economic theory. Then we shall briefly comment on the verification of particular economic theories applied to predict future events, and on the verification of strictly empirical hypotheses.

Verifying the Assumptions

First to summarize: We need not worry about independent verifications of the fundamental assumptions, the Assumed Type of Action; we need not be

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ourselves a mind similar to theirs." F. A. v. Hayek, "Scientism and the Study of Society," *Economica, New Series*, Vol. V (August 1942), p. 279. Reprinted F. A. v. Hayek, *The Counter-Revolution of Science* (Glencoe, Ill.: Free Press, 1952).

[40] Alfred Schuetz, "Common-Sense and Scientific Interpretation of Human Action," *Philosophy and Phenomenological Research*, Vol. XIV (September 1953), pp. 1–38. *Idem.*, "Concept and Theory Formation in the Social Sciences," *The Journal of Philosophy*, Vol. LI (April 1954), pp. 257–273.

[41] Schuetz, "Common-Sense, etc.," p. 34.

[42] Disregard of this requirement is, in my view, the only serious flaw in the otherwise excellent essay on "The Methodology of Positive Economics" by Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), pp. 3–43.

very particular about the independent verifications of the other intervening assumptions, the Assumed Conditions, because judgment based on casual empiricism will suffice for them; we should insist on strict independent verifications of the assumption selected as Assumed Change and of the conclusion derived as Deduced Change; not that the theory would be wrong otherwise, but it cannot be applied unless the phenomena to which it is supposed to apply are identifiable. *Simultaneous verifications of Assumed Change and Deduced Change count as verification—in the sense of non-disconfirmation—of the theory as a whole.*

Now it is clear why some writers insisted on the *a priori* nature of the theory and at the same time on its empirical value for the area of Applied Economics; for one may, if one wishes, regard the theory, or model, as a construction *a priori*, and the directions for its use, the instructions for its applications,[43] as an empirical appendage in need of verification. Returning to the analogy of the analytical machine, one may say that the machine and its parts are always "correct," regardless of what goes on around us, whereas the *choice* of the exchangeable parts and the *identification* of the events corresponding to the Assumed and Deduced changes may be wrong.

Testing the Predictive Values of Theories

We have examined the empiricists' charges against the theorists—charges of contemptuous neglect of the requirement of verification—and have concluded that these charges must be dismissed insofar as they refer to a failure to verify all assumptions directly and in isolation from the rest of the theory. We must yet examine another count of the charge of insufficient attention to verification: an alleged failure to test the correspondence between Deduced (predicted) and Observed outcomes. These kinds of tests are obligatory.

If verification of a theory takes the form of testing whether predictions based on that theory actually come true, one might think that this can be done in economics no less than in the physical sciences. It cannot, alas, because of the non-reproducibility of the "experiments" or observed situations and courses of events in the economy. For, while certain types of events, or "changes," recur in the economy often enough, they recur rarely under the same conditions. If some significant circumstances are different whenever a phenomenon of the same class recurs, each recurrence is virtually a "single occurrence." Economic theory applied to single events, or to situations significantly different from one another, cannot be tested as conclusively as can physical theory applied to reproducible occurrences and conditions.

Not long ago I was challenged to admit that my theories, even though applied to ever-changing circumstances, could be tested provided I were prepared to make unconditional predictions which could be compared with actual outcomes. Of course, I could only dare make unconditional predictions—without hedging about probability and confidence limits—where I was absolutely certain that my diagnosis of the situation (i.e., of *all* relevant circumstances) *and* my foreknowl-

[43] Cf. Milton Friedman, *op. cit.*, pp. 24–25.

edge of government and power group actions *and* the theory on which the prediction rests were all perfectly correct. Suppose that I was so foolhardy as to be sure of all this and that I did make a number of unconditional predictions. Still, unless reliable checks were possible to verify separately every part of my diagnosis and of my anticipations regarding government and power group actions, my theory could not be tested. There could be lucky "hits" where wrong diagnoses would compensate for mistakes due to bad theories; there could be unlucky "misses" where wrong diagnoses spoiled the results of good theorizing. Despite a large number of good hits the theories in question could not be regarded as confirmed, even in the modest sense of not being disconfirmed, because a joint and inseparable test of diagnosis, anticipations, and theory says nothing about the theory itself.

Where the economist's prediction is *conditional*, that is, based upon specified conditions, but where it is not possible to check the fulfillment of all the conditions stipulated, the underlying theory cannot be disconfirmed whatever the outcome observed. Nor is it possible to disconfirm a theory where the prediction is made with a stated *probability* value of less than 100 percent; for if an event is predicted with, say, 70 percent probability, any kind of outcome is consistent with the prediction.[4] Only if the same "case" were to occur hundreds of times could we verify the stated probability by the frequency of "hits" and "misses."

This does not mean complete frustration of all attempts to verify our economic theories. But it does mean that the tests of most of our theories will be more nearly of the character of *illustrations* than of verifications of the kind possible in relation with repeatable controlled experiments or with recurring fully-identified situations. And this implies that our tests cannot be convincing enough to compel acceptance, even when a majority of reasonable men in the field should be prepared to accept them as conclusive, and to approve the theories so tested as "not disconfirmed," that is, as "O. K."

Strictly Empirical Hypotheses

All this seems to circumscribe rather narrowly the scope of empirical verification, if not empirical research, in economics. But to draw such a conclusion would be rash. For there is a large body of economics apart from its theoretical or "hypothetico-deductive" system: namely, the empirical relationships obtained through correlation of observations, but not derivable, or at least not yet derived, from higher-level generalizations. Every science has such a body of strictly empirical hypotheses, no matter how fully developed or undeveloped its theoretical system may be.

I define a strictly empirical hypothesis as a proposition predicating a regular relationship between two or more sets of data of observation that cannot be

[4] This statement, it should be noted, refers to *general* theories which are part of a hypothetico-deductive system, not to strictly empirical hypotheses obtained by statistical inference. The predictions in question can never be in precise numerical terms, because no numerical magnitudes can be deduced from the assumptions of the type used in "general theory."

deduced from the general hypotheses which control the network of interrelated inferences forming the body of theory of the discipline in question. The distinction is made in almost all disciplines; it is best known as the distinction between "empirical laws" and "theoretical laws," though several other names have been used to denote the two types of scientific propositions. The philosopher Morris Cohen spoke of "concrete laws" in contrast to "abstract laws." Felix Kaufmann, though using the terms empirical and theoretical laws, characterized the former as "strict laws," the latter as "rigid laws." The physicist Henry Margenau contrasted "epistemic" or "correlational laws" with "constitutive," "exact," or "theoretical" laws. And Carl Menger, the founder of the Austrian School and protagonist in the *Methodenstreit*, distinguished "empirical laws" from "exact laws," the latter dealing with idealized connections between pure constructs, the former with "the sequences and coexistences of real phenomena."[45]

The study of the "sequences and coexistences" of the real phenomena depicted in statistical records yields correlational and other empirical findings which have to be tested and modified whenever new data on the same class of phenomena become available. While the constructs and deductions of the theoretical systems will influence the selection, collection and organization of empirical data, the particular relationships established between these data by means of correlation analysis and other statistical techniques are not deducible from high-level assumptions and can neither confirm nor disconfirm such assumptions. But these relationships, especially the numerical estimates of parameters, coefficients, or constants, are themselves subject to verification by new observations.

Verification of Empirical Hypotheses

Every one of us has lately been so much concerned with statistical demand curves, saving and consumption functions, investment functions, import elasticities and import propensities that a description of these and similar research activities is not necessary. The trouble with the verification of the empirical hypotheses derived by means of statistical and econometric analysis is that successive estimates on the basis of new data have usually been seriously divergent. Of course, such variations over time in the numerical relationships measured are not really surprising: few of us have expected these relationships to be constant or even approximately stable. Thus when new data and new computations yield revised estimates of economic parameters, there is no way of telling whether the previous hypotheses were wrong or whether things have changed.

That the numerical relationships described by these empirical hypotheses may be subject to change—to unpredictable change—alters their character in an essential respect. Hypotheses which are strictly limited as to time and space are not "general" but "special" hypotheses, or *historical propositions*. If the relationships measured or estimated in our empirical research are not universal but historical propositions, the problem of verification is altogether different—so different that according to intentions expressed in the introduction we should

[45] Carl Menger, *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere* (Leipzig: Duncker & Humblot, 1883), pp. 28, 36.

not be concerned with it. For we set out to discuss verification of *generalizations*, not of events or circumstances confined to particular times and places. If all propositions of economics were of this sort, the dictum of the older historical school, that economics cannot have "general laws" or a "general theory," would be fully vindicated.

If a hypothesis about the numerical relationship between two or more variables was formulated on the basis of statistical data covering a particular period, and is later compared with the data of *another period*, such a comparison would be in the nature of a verification only if the hypothesis had been asserted or expected to be a universal one, that is, if the measured or estimated relationships had been expected to be constant. In the absence of such expectations the test of a continuing "fit" (between hypothesis and new data) is just a comparison between two historical situations, an attempt to find out whether particular relationships were stable or changing. A genuine verification of a previously formulated hypothesis about a given period calls for comparisons with additional data relating to the *same period*, to check whether the previous observations and their previous numerical description had been accurate. In brief, a historical proposition can only be verified by new data about the historical situation to which it refers. This holds also for geographic propositions and comparisons between different areas.

However, although the changeable "structures"[48] estimated by statistical and econometric researchers are nothing but historical propositions, there are probably limits to their variations. For example, we may safely generalize that the marginal propensity to consume cannot in the long run be greater than unity; or that the elasticity of demand for certain types of exports of certain types of countries will not in the long run be smaller than unity. Statements about definite limits to variations of special or historical propositions are again general hypotheses; they are not strictly empirical but universal in that they are deducible from higher-level generalizations in the theoretical system of economics. The various successive estimates of changeable structures may then be regarded as verifications of general hypotheses according to which certain parameters or coefficients must fall within definite limits. Since these limits are usually rather wide, verification will of course not be the rigorous kind of thing it is in the physical sciences with its numerical constants and narrow margins of error.

But neither this nor anything else that has been said in this article should be interpreted as intending to discourage empirical testing in economics. On the contrary, awareness of the limits of verification should prevent disappointments and present challenges to the empirical worker. May he rise to these challenges and proceed with intelligence and fervor by whatever techniques he may choose.

[48] In the sense used by Tjallong Koopmans and other econometricians.

THE PER SE DOCTRINE AND THE NEW RULE OF REASON*

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A well-known economist recently opened a seminar on antitrust problems with the observation: "Lawyers like rules; economists like models." This terse distinction finds its basis in fundamental differences between legal and economic disciplines. Economics is concerned primarily with the deductive laws of human behavior which explain how man orders economic activity; the law, on the other hand, is the accepted set of rules of conduct for the ordering process. The economist describes the operation of fundamental laws through the erection of models; the lawyer appraises the way such laws operate in the light of existing statutes and case precedents, or rules.

Accordingly, in economics monopoly is identified with certain conditions of demand or supply as they reflect in market models. These conditions exist irrespective of the law applied to them, and indeed irrespective of whether *any* law is applied to them. Similarly, a trade restraint exists when any arbitrarily imposed force *a priori* impedes the functioning of the competitive market model. But in a purely legal sense monopoly and restraints of trade exist only when the law so defines them. Thus, economics makes no distinction between vertical price maintenance agreements in Fair Trade and in non Fair Trade states. The law does.

In brief, monopoly and trade restraints are basically and ultimately economic phenomena. It would scarcely seem necessary to emphasize this fact to anyone, least of all economists. Yet, a debate is raging in the current literature over the merits of the economic approach to the monopoly problem. While it is not yet altogether clear that the two schools of thought are debating each other, some obvious differences between them have emerged. On the one hand, the Honorable Edward F. Howrey[1] and Professor S. C. Oppenheim, respectively the Chairman of the Federal Trade Commission and the Co-chairman of the Attorney General's Committee to Study the Antitrust Laws, have argued that the presence or absence of monopoly should be judged on the basis of all the economic and marketing facts. They have advanced this policy proposal under the banner of a new rule of reason, which in principle accepts the economist's concept of workable competition and rejects any substantial extension of (but not the execution of)

* A paper delivered before the Twenty-Fourth Annual Conference of the Southern Economic Association, Biloxi, Mississippi, November 20, 1954.

[1] Hon. Edward F. Howrey, "Revaluation of Commission's Responsibilities," an address before the 1953 Institute Federal Antitrust Laws, University of Michigan Law School, Ann Arbor, Michigan; S. C. Oppenheim, "Federal Antitrust Legislation: Guideposts to a Revised National Antitrust Policy," *Michigan Law Review*, June 1952, pp. 1139–1244. See also Clare E. Griffin, *An Economic Approach to Antitrust Problems* (Washington, D.C.: American Enterprise Association, 1951).

the *per se* doctrine. On the other hand, the opposing school, of which Professor Walter Adams is perhaps its most vocal member, has argued that the execution of such a proposal would render the antitrust laws ineffective.[2] In the words of Professor Adams, it "would mean judicial emasculation of Section 1 of the [Sherman] Act, . . . and would be tantamount to a toleration of monopoly under Section 2."[3] Moreover, Adams asserts, the new rule of reason would add neither clarity nor certainty to the litigation and adjudication of antitrust violations. As Adams puts it: "In view of the almost monolithic evolution of the case law under Section 1, it is difficult . . . to ascertain the respects in which the law is unclear or uncertain . . . . Section 1 has become painfully clear,"[4] and Section 2 is emerging with "increasing clarity."[5] A reasonably large number of economists have identified themselves with each of these two approaches. Hence our opening observation should be revised to read: "Some lawyers and economists like rules; others like models."

It is to this debate, especially to the evidence proponents of the *per se* or purely legalistic approach offer in support of its historical effectiveness, that this paper is addressed. At the outset, however, both the *per se* and rule of reason doctrines are in need of clarification. In antitrust law a *per se* violation means that certain types of conduct are illegal as such in that injury to competition is conclusively presumed. This prohibitory side of the *per se* doctrine is the only side that has been considered either by the doctrine's opponents or defenders. It is evident, however, that if the doctrine is to be accurately appraised as to its effectiveness as an *approach*, it must also be construed so as to embrace those types of practices which are *legal* as such, in that antitrust agencies are foreclosed from proceeding against them on the grounds that they impair competition. From the point of view of antitrust law administration, such practices are conclusively presumed to be non-monopolistic or non-restraining in character. Examples of *per se* prohibitions are Sections 2(d) and 2(e) of the Clayton Act, as amended by the Robinson-Patman Act. Examples of trade practices that are *per se* legal are resale price maintenance in the 45 states having Fair Trade laws and the maintenance of bituminous coal prices by industry-wide collective action while the Bituminous Coal Act was in force.

Both the trial and adjudication of Section 1 cases can clearly be facilitated by *per se* rules; given them, the court merely has to employ the simplest of syllogistic (deductive) reasoning:

Major premise (the rule): all tyrants deserve death
Minor premise (the evidence): Caesar is a tyrant
Conclusion (the decision): Caesar deserves death.

[2] Walter Adams, "The 'Rule of Reason': Workable Competition or Workable Monopoly," *Yale Law Journal*, January 1954, pp. 348–370; see also George W. Stocking, "The Rule of Reason, Workable Competition and the Legality of Trade Association Activities," *The University of Chicago Law Review*, Vol. 21, No. 4 (1954), pp. 527–619.

[3] Adams, *op. cit.*, p. 348.

[4] *Ibid.*, p. 352.

[5] *Ibid.*, p. 353.

But while selected *per se* rules can be *a priori* helpful, this does not mean that the purely legalistic approach to monopoly is the approach that has yielded or is most likely to yield optimum results, i.e., prevent or remedy the most monopoly, or if you are something of a Schumpeterian—and many of us are—the most socially undesirable monopoly. However, we can digress here to identify the essential elements of effective legalistic or *per se* antitrust prosecution.

1. The law must conform to true definitions of monopoly.

2. The law must embrace *all* the possible monopoly events to which such definitions are applicable.

3. Evidence must be available which can accurately establish the fact that the monopoly event—as defined—did or did not occur.

As we shall see later, the absence of these elements, especially (1) and (2), has rendered the *per se* approach much less effective than it otherwise might have been.

Under an economic—or rule of reason—approach to the monopoly problem, the burden of proof and the costs of litigation are likely to be considerably greater. It is incumbent upon the trial and adjudicatory machinery not only to establish the occurrence of the event, but to establish further that the event injures—or may injure—competition. Hence, the initiation of rule of reason antitrust cases, presuming the existence of a general prohibition on monopoly,[6] *must* arise out of economic definitions of monopoly, and the effective adjudication of such cases must depend as much upon the strength of the economic analysis as upon the facts presented.

I have identified the *per se* doctrine with the proponents of the legalistic approach and the economic approach with the advocates of the new rule of reason. While these identities may encounter objections from some members of both schools of thought, I believe such objections, if raised, would derive largely from ambiguous language. The "old" rule of reason was widely interpreted as tantamount to "leaving well-mannered monopoly alone." The "new" rule of reason, as defined by its proponents, proposes the "consideration and analysis of all the relevant marketing and economic factors. The ultimate test, under this approach, is whether an arrangement involves presence or absence of prejudice to the public interest," after all the economic facts are known.[7] Taken at their face value, the two rules bear little resemblance to each other.

However, contemporary advocates of the rule of reason have left room in their public pronouncements for serious doubt as to whether they are proposing something new or are simply offering us, as Adams has asserted, old wine in new bottles. On the one hand their textual references to the rule of reason are usually

[6] Since under the "new" rule of reason injury to competition is the sole test of illegality, only one law, a general prohibition on monopoly and restraint of trade, would be necessary. The fragrance of competition, like that of roses, is not contingent upon the name we call it.

[7] The Hon. Edward F. Howrey, Chairman, Federal Trade Commission, "Economic Evidence in Antitrust Cases," a speech before the American Marketing Association, June 14, 1954, Atlantic City, N. J. See also Oppenheim, *op. cit.*, p. 1197.

accompanied by citations of decisions based upon the old rule of reason.[8] Such citations create the impression that the authors would concur in such decisions, and find them compatible with the rule of reason they currently espouse. Most students of antitrust, including the writer, would agree that such decisions were scarcely based upon "a careful appraisal of all the economic and marketing factors," and even if they were, they were not consistent with the intent of the Sherman Act.

When confronted with what appears to be conflicting language, it is best that we judge the new school by what they do rather than entirely by what they say. Fortunately, we have some evidence of what sort of litigation and decisions the new rule of reason might be expected to produce, in the form of the Federal Trade Commission's recent *Pillsbury* decision, and in the form of several of the Commission's recent complaints.

The Pillsbury decision is triply significant: it is the first decision under Section 7 of the Clayton Act, as amended, and accordingly is likely to set the pattern for subsequent cases; it is also the first merger decision written by Chairman Howrey, a proponent of the rule of reason, and hence gives his version of the rule its substantive form; it is further the first decision of an antitrust agency based almost entirely upon facts developed through economic analysis and market surveys, and accordingly has important implications for the role of economic analysis in the future. For these reasons, the case will be described here in some detail.

A complaint was issued against Pillsbury on June 16, 1952, charging that that company's acquisition of Ballard and Ballard and Duff violated Section 7 of the Clayton Act, as amended. The hearing examiner, without expressing an opinion as to whether the law had been violated, subsequently granted the respondent's motion to dismiss the case on the grounds that "allegations of the complaint were not supported by reliable, probative and substantial evidence." The Commission's attorneys supporting the complaint appealed the hearing examiner's decision, and on this appeal the Commission, in an opinion written by the Chairman, remanded the case to the hearing examiner, stating that a *prima facie* case of a substantial lessening of competition had been established by the evidence—evidence that merits a review here.

By current measures of oligopoly, concentration in flour milling was not high. In 1951 the ten largest companies accounted for 40 per cent of the nation's total milling capacity. Even in the Southeast, where the acquiring and the two acquired firms were in close competition with each other, the shares of specific markets controlled by each of the firms were relatively small: in the sale of family flour, Pillsbury, the 5th largest seller, accounted for 3.66 per cent; Ballard & Ballard, the 3rd largest seller, accounted for 4.65 per cent; and Duff's produced no family flour. In the sale of baking flour, Pillsbury, the 3rd largest seller, accounted for 4.93 per cent; Ballard & Ballard, the 9th largest seller, accounted for 3.62 per cent; and Duff's produced no baking flour. Only in the sale of prepared flour-base mixes did the relative market shares of the merging firms take

[8] See especially citations of *United States* v. *United States Steel Corp., et al.*, 334 U. S. 495 (1948), by Howrey and Oppenheim, *supra*.

on oligopoly proportions: here Pillsbury, the largest seller, accounted for 22.7 per cent; Ballard & Ballard, the 3rd largest, accounted for 12.0 per cent; and Duff's, the 5th largest, accounted for 10.2 per cent. However, as every housewife who prepares the family meal would surely testify, the elasticity of substitution between prepared flour-base mixes and alternative sources of bread is high. Accordingly, the Commission could excusably have reasoned that the merging of 44.9 per cent of the prepared flour-base mixes capacity did not indicate much monopoly growth in view of all the alternative substitutes. We conclude, therefore, that the new rule of reason does not, as its critics have asserted,[9] excuse mounting concentration on the grounds that alternative substitutes are available.

Nevertheless, while conceding that nothing in the record indicated that Pillsbury's acquisition would convert the southeastern flour milling industry from a competitive to a non-competitive pattern,[10] the Commission concluded that a *prima facie* case of "tending substantially to injuring competition" had been established. In reaching this decision the Commission stated:

"As we see it, amended Section 7 sought to reach the mergers embraced within its sphere in their incipiency, and to determine their legality by tests of its own. These are not the rule of reason of the Sherman Act, that is, unreasonable restraint of trade, nor are Section 7 prohibitions to be added to the list of *per se* violations. Somewhere in between is Section 7, which prohibits acts that 'may' happen in a particular market, that looks to 'a reasonable probability,' to 'substantial' economic consequence, to acts that 'tend' to a result." Hence, the Commission argued that the evidence met the tests of "common sense" and "reasonable mind," and while conceding that these were far from specific standards, they could none the less be applied on a case by case basis with "convenient vagueness." To further clarify what it meant by these tests, the Commission gratuitously observed that the merger in *U.S.* v. *Columbia Steel Co.*, 334 U.S. 495 (1948) which was approved under Sherman Act tests, would probably not have been approved under the tests of illegality employed in the Pillsbury decision.

In the meantime the Commission has issued complaints under Section 7 against Crown Zellerback in the coarse paper industry and Luria Bros. in the scrap iron industry. While both companies are relatively large in particular geographical areas, neither has attained a position close to total market dominance through merger. The grounds for both complaints, as in the Pillsbury remand, is incipient monopoly.

This, then, is the new rule of reason. It calls for careful economic definition and analysis and is directed toward reasonable probability and incipient monopoly. It permits prospective tests, tests which are adaptable to economic theory, which is itself prospective, or to employ more popular nomenclature, predictive in character. In action thus far it has borne little resemblance to the old rule of

[9] See Adams, *op. cit.*, pp. 362–364.

[10] "The inference, in fact, must be to the contrary, inasmuch as large national distributors, such as General Mills and Quaker Oats, and large regional distributors remain to furnish effective competition to Pillsbury Mills." Commission's *Opinion*, Docket No. 6000, p. 16.

reason enunciated in the earlier *Standard Oil* and the *U. S. Steel* decisions, and surely cannot be construed, as Professor Walter Adams has construed it, as "tantamount to a toleration of monopoly under Section 2 [of the Sherman Act]."[11]

But critics of the new rule of reason appear to have committed a much less understandable error than that of inferring an identity of concepts from similarity of language. By focusing their attention exclusively upon instances where the *per se* or purely legalistic approach has been applied to the monopoly problem with at least a modicum of uniformity and success, they appear to have attributed to the doctrine a degree of effectiveness, consistency, and coherency in antitrust policy which finds little support in recent economic history. Indeed, the statutory and case laws that have established *per se* prohibitions seem to have set in motion a corresponding volume of statutory and case exemptions, and when viewed collectively, the prohibitions themselves comprise a rule of reason, a rule of reason that surely bids to alter the course of antitrust in a greater and more enduring measure than is in prospect from the underlying philosophy of the recent enunciated Pillsbury doctrine. Indeed, it may already have done so.

For example, in antitrust circles nearly everybody agrees that price-fixing is illegal *per se*. This agreement stems from the pattern of court decisions passed down since 1898 in cases involving Section 1 of the Sherman Act.[12] The courts have generally held to the doctrine enunciated in the *Addyston Pipe and Steel Case* (1898), namely, that it was not incumbent upon them to "launch upon a sea of doubt" by examining the reasonableness of price fixing agreements, or to say how much restraint was in the public interest. Hence, if the agreement fixed prices at all, it was *per se* illegal. In the *Appalachian Coals Case of 1933*, however, the Court exercised "reasonableness," and stated that an agreement to fix the price of 54 per cent of the coal mined in the Appalachian area was designed to mitigate the hardship of producers in a disorganized and depressed industry during a period of general depression.[13] Moreover, the Court, on one occasion at least, in the *Cracking* case of 1931, condoned price fixing on the grounds that the parties to the agreement did not dominate the industry.[14]

These two departures from the *per se* doctrine occurred in the midst of the Great Depression, and one is tempted to suggest that even the decisions of the courts reveal a limited rule of reason approach to price fixing agreements, namely, that their illegality is contingent upon the general state of the economy. However, the argument presented here is not that the courts, through the employment of reasonableness of either the old or new variety, have rendered the purely legalistic

[11] Adams, *op. cit.*, p. 349.

[12] *United States* v. *Addyston Pipe & Steel Co.*, 85 Fed. 271/6th Cir. (1898); *Standard Oil Co.* v. *United States*, 221 U. S. 1 (1911); *United States* v. *Trenton Potteries Co.*, 273 U. S. 392 (1927); *Appalachian Coals, Inc.* v. *United States*, 288 U. S. 344 (1933); and *United States* v. *Socony-Vacuum Oil Co.*, 310 U. S. 150, 214 (1940).

[13] *Appalachian Coals, Inc.* v. *United States*, 288 U. S. 344 (1933).

[14] *Standard Oil Co. (Indiana)* v. *United States*, 283 U. S. 163 (1931). Here the Court sanctioned the fixation of royalty rates as a part of an arrangement to cross-license competing patents because the quantity of gasoline involved was too small to influence the price of gasoline to consumers.

or *per se* approach to antitrust vague and ineffective. It is rather that Congress, through the enactment of legislation designed to place certain monopoly practices beyond the reach of the antitrust laws, has rendered this historical role of the courts largely obsolete and unnecessary. In short, under the *per se* approach, the application of reasonableness has simply been transferred from the courts to Congress.

It is exceedingly difficult to measure in quantitative terms the extent to which Congressional "reasonableness" has rendered the Antitrust Laws, especially Section 1 of the Sherman Act, inapplicable to monopoly and restraints of trade. Under NRA Section 1 it was virtually suspended; in more prosperous times exemptions have been of the selective sort. As of this writing the most important of such exemptions include price fixing by farmer cooperatives, wage fixing by labor unions, vertical price fixing in the 45 states which have enacted Fair Trade laws, and in basic agricultural commodities Congress has played a direct role in the price fixing process. Not many years ago the list would also have included Bituminous Coal. Further, labor, non-corporate agricultural and horticultural organizations, and railroads are exempt from all the antitrust laws. But for a Presidential veto of Senate bill 1008 on June 16, 1950, basing point pricing might now also be legal *per se*, or at least to attack basing point pricing on the grounds that it was a price fixing conspiracy would have been rendered exceedingly difficult. A Bill (S. 3596) is now before the Senate Subcommittee of the Committee on Interstate and Foreign Commerce to amend the Federal Trade Commission Act so that the "Anti-bootlegging" clause may be inserted in automobile dealer franchises with immunity from the antitrust laws. Proponents of the bill clamor for its enactment because it would "stabilize" new car prices. Opponents of the bill claim that it would eliminate competitive pricing. Both sides seem to agree that enactment of the bill would tend to legalize a certain amount of price fixing.[15]

No one can predict where the *per se* legalization of what has heretofore been viewed as monopoly and trade restraints in an economic sense will finally stop. However, it has already proceeded far enough to have destroyed the clear historical distinction between the *per se* and rule of reason doctrine. Congress has provided the exemptions and qualifications which opponents of the rule of reason do not wish left to the discretion of the Courts. Accordingly, contrary to the allegations made by each school of advocates, the current debate is not over whether we shall on the one hand have inviolate specific prohibitions against monopoly, or on the other adopt the approach of reasonableness. Rather, it is a debate over whether reasonableness and discretion shall be exercised by the legislature or by the judiciary and the Federal Trade Commission.

On such a question each is of course entitled to his own views, and in the final analysis the debate will be decided—if decided at all—by persuasion rather than rigid standards of proof. However, there are cogent arguments in favor of legislating a general prohibition against injury to competition and leaving the exercise of reason in the hands of the Commission and the courts. The most important of such reasons is that this now appears to be the only approach that promises to

[15] *Hearing Before a Subcommittee of the Committee on Interstate Commerce*, U. S. Senate, Eighty-third Congress, Second Session, on S. 3596, July 20, 1954.

rescue the broad purposes of the original Sherman Act from obscurity. Under the prevailing maze of laws, some of which condemn, some of which condone, and some of which nurture monopoly and restraints of trade, the over-all intent of antitrust has become inextricably confounded with welfare and political considerations for special vocational groups. It may very well be that in a world of imperfectly competitive markets, the farmer, the cooperative, the retail druggist, the electrical appliance distributor, the local purveyors of automobiles, perfumes, alarm clocks, liquors, and many others, merit special considerations on welfare grounds. However, it must not be forgotten that one of the principal economic indictments of monopoly power in the market sense is that it restricts the use of resources in the monopoly sector relative to the competitive sector of the economy, and that hence the net national product could be increased by shifting resources out of competitive industries where the value of the marginal product is relatively low and into monopolistic industries where the value of the marginal product is relatively high. But it is not at all clear that a reduction of competition in otherwise competitive markets provides either the most expeditious or effective remedy. Moreover, as the 20-year fight preceding the injection of 8½ per cent more flexibility into the prices of basic agricultural crops and the history of Fair Trade will attest, the *per se* legalization of noncompetitive pricing is itself an impossibly inflexible policy, and virtually unsusceptible to the periodic reappraisal it would normally undergo in the courts and before the Commission.

But completely apart from the above argument in support of a judicial as opposed to a legislative rule of reason is the argument that arises out of the fact that monopoly and competition are basically economic concepts. Economic analysis, like the adjudicatory process, must center upon the individual case. Both its advocates and critics would agree that the concept of workable competition, or its necessary equivalent, has not yet been formally developed to the point where it can usefully be incorporated into the law itself. That is to say, *indicia* of monopoly that can be unswervingly and uniformly applied to all industries, irrespective of their market environment and stage of development, have not yet been clearly identified. However, economic analysis can play a significant role in antitrust administration if the law itself constitutes a general prohibition against monopoly and restraints of trade, and leaves the question of illegality open in each specific case until the appropriate economic analysis has been made.

This does not mean, of course, that the cumulated body of case law that has established certain presumptions of illegality should or could be scrapped. Attorneys, economists, and judges alike have long recognized that agreements among sellers to fix prices can be presumed to injure competition. A similar but not so longstanding presumption exists with respect to basing point pricing.[16]

[16] However, basing point pricing is not illegal per se; rather conscious parallel action (as well as conspiracy) which *injures competition* is unlawful. The Federal Trade Commission has found that the sustained use of complicated basing point systems is substantial though not conclusive evidence of conspiracy and conscious parallel action. See George W. Stocking, *Basing Point Pricing and Regional Development* (Chapel Hill, N. C.: University of North Carolina Press, 1954), p. 185.

Were it not for the legislative exemptions to these doctrines they would fulfill all the requirements of effective *per se* rules discussed earlier in this essay.[17] But the most cogent reason why such presumptions have been established is that economic analysis has already been substantial (perhaps even conclusive) on these matters: no economist has yet constructed a model demonstrating that a conspiracy among sellers to *raise* prices could possibly reflect *increased* competition, even in those areas where the law permits it. Economic analysis currently provides no such conclusive presumptions with respect to acquisitions, mergers, non-proportional advertising allowances, and many other such interfirm transactions. If and when it does establish such presumptions, they clearly should be employed in the processes of litigation and adjudication. To act otherwise would result in an obvious and unnecessary waste of legal resources.

A special plea for more economic analysis in the administration of the antitrust laws, which as a by-product will sooner or later establish such presumptions, is what I consider to be the essence of the "new" rule of reason. Since monopoly and competition are basically economic phenomena, the *a priori* arguments for accepting it as an effective approach to the monopoly problem are clear. But to accept the new rule of reason would require the substitution of a general prohibition against monopoly for the many specific prohibitions and sanctions now contained in the law itself, and which collectively give expression to what I have called a legislative rule of reason. Proponents of the *per se* approach are not likely to view such a proposed revision of the law without alarm. But if their alarm springs from convictions as to the historical effectiveness of specific prohibitions against monopoly, it finds little support in antitrust history. Indeed, a case can be made that the broad purpose of the antitrust laws has miscarried because of the limitations imposed by their specificity as frequently as it has because of any vagueness in expression of their general intent. For example, merger by asset acquisition was beyond the reach of antitrust agencies for 36 years not so much because Section 7 of the Clayton Act was not amended until 1950, but rather because the original Act of 1914 specified as illegal merger by stock acquisition that substantially lessened competition. Had the original Act been less specific, the 36-year hiatus and the 1950 Amendment would have been unnecessary. It could even be argued that the unfortunate perversion of the Sherman Act in the *Knight*[18] decision was precipitated by the clause specifying "trade or commerce," and the resulting semantic gymnastics, rather than by any inherent vagueness of intent in the Act itself.

When to such legalistic interferences with purpose are added the *per se* legal sanctions of restraint of trade, the record would scarcely reveal the high order of effectiveness of the purely legal approach to monopoly that its proponents have recently ascribed to it. Indeed, it is a rather curious reversal of form that the current proponents of the legalistic approach were only several years ago lamenting its ineffectiveness.[19] The new rule of reason, employed as its proponents em-

[17] *Supra.*, p. 4.

[18] *U. S.* v. *E. C. Knight Co.*, 156 U. S. 1 (1895).

[19] *Cf.* Walter Adams, "The Aluminum Case: Legal Victory, Economic Defeat," *American Economic Review*, Vol. XLI, No. 5 (December 1951), pp. 915-922.

ployed it in the *Pillsbury* decision, points toward an alternative approach. Since it rests squarely upon an appraisal of all the economic evidence it at least can be expected to focus attention upon the relevant facts of the case rather than upon the semantics of law, and upon remedy rather than purely legal victory. In the process it will very likely substitute reason for rules. This may or may not produce a more effective antitrust policy. But we may take hope in the fact that man allegedly distinguishes himself not by his capacity for rote but by his capacity to reason.

STATE PER CAPITA INCOME DIFFERENTIALS: 1940 AND 1950[1]

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INTRODUCTORY BACKGROUND

Analysts of differences in state per capita incomes are faced, like all analysts who seek to explain dispersion about a measure of central tendency, with the problem of finding causal factors of an acceptable degree of significance under both static and dynamic conditions. In an earlier paper[2] in the *Southern Economic Journal*, four factors were tested in a regression analysis with state per capita incomes for 1940. Since one year was represented, the results were applicable to the static situation only. The four factors were: X2, per cent employed labor force in agriculture, forestry, and fisheries; X3, per cent population employed; X4, per cent population Negro; and X5, median years of schooling completed of males 25 years old or over.[3]

The thesis was that state per capita income differences are a function of stage of economic development of the geographic unit, and of the extent and effectiveness of participation of the labor force in the economic organization. X2, measuring the relative size of agriculture in the economic organization, reflected inversely the economic evolution of the economy, that is, the higher the percentage of the employed labor force occupied in agriculture the more elementary the form of economic organization, hence the lower the per capita income. The extent of participation of the population in the economic organization was reflected mainly by two factors; namely, X3, the per cent of the population employed, and X4, the per cent of the population Negro. Since per capita income is the weighted quotient resulting from division of total income by the entire population, the significance of per cent population employed (X3) as a measure of participation becomes obvious; for it includes the influence of unemployable children, the aged and the crippled, women unemployed by choice, and unemployed men of the regular working force, as well as, of course, all the employed. X4, percentage of the population Negro, measures in a rough way the effects on economic returns which result from obstacles to employment and discrimination in pay of an important group in the population. The factor shows a lack of full participation of a segment of the population in the economic organization for production which exists in a given geographic unit.

The fourth factor, X5, the median years of schooling completed of all males 25

[1] Paper presented at the Twenty-fourth Annual Conference of the Southern Economic Association, Biloxi, Mississippi, November 19, 1954. The necessary clerical aid was obtained through a research grant from the University Center in Georgia, which the author gratefully acknowledges.

[2] John L. Fulmer, "Factors Influencing State Per Capita Income Differentials," *Southern Economic Journal*, XVI (January 1950), pp. 259–266.

[3] *Ibid.*, pp. 259–262, for a more detailed definition of the independent factors.

years old or over, was selected for workers of this age class as being more representative of the educational level of the labor force than any other measure available. It does minor violence to the employed females who are about one-third as important as men in the labor force; however, this minor source of error may be disregarded since the educational levels of both sexes are highly associated. This factor was assumed to measure the relative effectiveness of the participating population in the prevailing economic organization. The validity of this assumption is widely supported by census releases and various economic studies of the effect of education on yearly income.

The four factors in a linear regression with state per capita income resulted in a highly significant coefficient of determination of 89 per cent. The regression coefficients of the different factors were also statistically significant at the 1 per cent point. Thus the analysis produced significant results for the static situation.

In the original paper only cursory attention was devoted to the dynamic problems. The dynamic aspects of the problem of state per capita income differences could not be attacked effectively because data for the variables were available for only one year. The effect of dynamic factors, however, was not ignored, for both graphic and correlation analyses were made between per capita income and the Index of Wholesale Prices. The effect of changes in the general price level for a 19-year period on Mississippi per capita income, a state of low economic development, and New York state per capita income, a state of high economic development, was tested in a regression analysis involving logarithmic functions. Mississippi per capita income proved to be over twice as responsive to a unit change in the General Price Level as New York state. Further work with these states and the two regions which they represent led to the conclusion that state per capita incomes responded to swings in the business cycle like an accordion, the states of low economic development rising relative to the states of high economic development as business activity picks up and conversely. The section on dynamic influences was concluded by a study of trends in the factors with the South in a comparative analysis with all other states. The conclusion was that three factors, X2, X4, and X5, had been improving in the direction of both higher state per capita incomes and smaller differences between states. A trend study of X3, per cent of population employed, was not made, although if it had been the interpretation of results would have been obscured by the cyclical influence of variations in unemployment.

In an article in the same journal of October, 1950, Mr. Harold Breimyer argued that some of the regression values of the independents, particularly X2, would be recast by changes in the level of economic activity. Both his attempts and mine in a later article to test the validity of the hypothesis, employing 1940 values of the independents with 1948 state per capita incomes proved inconclusive, in part because of the difference in the time interval between 1940 and 1948 but more importantly because of the effect of improvements in values of the independents which could not be measured.[4]

[4] Harold F. Breimyer, "Some Comments on Factors Influencing Differences Between State Per Capita Incomes," *Southern Economic Journal*, XVII (October 1950), pp. 140–147.

OBJECTIVES OF STUDY

With this background we are now prepared to proceed to the two main tasks of this paper, namely: first, comparison of regression coefficients for 1940 and 1950 in the static sense with interpretations relative to the effect of improvements in the factors, and secondly, a dynamic analysis of both years compositely by introduction of a factor to reflect impacts of level of business activity on the different states. A prelude to the first objective is a study of changes in the factors from 1940 to 1950.

TRENDS IN FACTORS FROM 1940 TO 1950

Comparisons of the changes in the factors for all the states[5] and 13 Southern states are given in Table 1, which shows that during the 10-year period the independents improved in the direction favorable to higher per capita incomes, both for all states and for 13 southern states as composites. The decline in the percentage of the employed labor force in agriculture was 31 per cent for all states and 35 per cent for the South. The per cent of total population employed increased more rapidly for all states than for the South, 8 per cent and 5 per cent respectively. The larger relative improvement of employment in the states outside the South following the quick rise of economic activity after 1940 is not unexpected since it has been established[6] that unemployment was lower relatively in the South during the depression 30's. The decrease in the per cent of the population Negro was vastly more rapid in the South than in all states, 10 per cent as compared to 1 per cent. A careful study of the table will reveal that the national totals showed a 2 per cent increase in the population ratio for Negroes; whereas the mean of state ratios for all states showed a 1 per cent decline. The difference is due to a statistical discrepancy between a ratio derived from a total for the nation as compared to a simple average of 49 separate ratios. Because we are analyzing dispersion about a mean, the simple average of the separate ratios is preferable for our purpose, not only for this factor but for all others. The median years of schooling of males 25 years old and over improved somewhat less rapidly in the South,[7] contrary to popular opinion.

[5] In the discussion hereafter the District of Columbia is included with the 48 states.

[6] See Rupert B. Vance, *All These People: The Nation's Human Resources in the South* (Chapel Hill: University of North Carolina Press, 1945), pp. 328–330. This has been explained by Hoover and Ratchford as due to the comparatively higher concentration of production of nondurable goods in southern industry, which are not as responsive to changes in the level of business activity as durable goods, the manufacturing of which is more prevalent in the Northeast and Middle Atlantic regions. See C. B. Hoover and B. U. Ratchford, *Economic Resources and Policies of the South* (New York: Macmillan Co., 1951), pp. 117–118. See also Stefan H. Robock, "Industrialization and Economic Progress in the Southeast," *Southern Economic Journal*, XX (April 1954), p. 310.

[7] Median years of schooling of males 25 years old and over is obviously only one measure, and probably not the best measure, of improvement in educational level. However, computed as an average of the state medians, it does give an overall measure of differences in educational improvement between the South and all states. Incidentally, the finding of a smaller increase in the educational level of working males in the South during the 1940–50 decade as compared to working males for all states is confirmed by a similar finding as regards females 25 years old and over.

TABLE 1

*Comparison of Changes in Variables from 1940 to 1950, including Measures of Dispersion for All States**

Year and Factor	Aggregate Value for The Nation	48 States Plus D. C.			13 Southern States	
		Average of state values	Standard deviation	Coefficient of variation	Average of state values	Per cent of all states
1940						
X_2. Per cent employed labor force in agriculture, forestry and fisheries†	19.8	25.1	15.0	59.8	37.5	149
X_3. Per cent total population employed	34.3	33.9	3.6	10.7	32.8	97
X_4. Per cent population Negro	9.8	9.6	13.1	136.7	26.8	279
X_5. Median school year completed of all males 25 years old and over	8.3	8.2	0.75	9.1	7.3	89
X_1. Per capita income, dollars	575	532	195	36.6	332	62
1950						
X_2. Per cent employed labor force in agriculture, forestry and fisheries†	13.0	17.4	11.2	64.1	24.5	141
X_3. Per cent total population employed	37.3	36.7	3.0	8.2	34.4	94
X_4. Per cent population Negro	10.0	9.5	12.0	126.3	24.2	255
X_5. Median school year completed of all males 25 years old and over	9.0	9.2	1.0	10.9	8.1	88
X_1. Per capita income, dollars	1,440	1,357	317	23.4	981	72
Percentage change, 1940–50						
X_2. Per cent employed labor force in agriculture, forestry and fisheries†	−34	−31	−25	7	−35	113
X_3. Per cent total population employed	9	8	−17	−23	5	63
X_4. Per cent population Negro	2	−1	−8	−8	−10	1,000
X_5. Median school year completed of all males 25 years old and over	8	12	33	20	11	92
X_1. Per capita income, dollars	150	155	63	−36	195	126

* Includes D. C.

† Excluding government workers from the active labor force.

Thus it appears that the South had more rapid improvement in two factors, per cent of employed labor force occupied in agriculture and per cent population Negro, while all the states had greater improvement in the other two factors, per cent total population employed and median years of schooling completed of males 25 years old and over. The dependent factor, per capita income, increased 195 per cent in the South during the 10 year period as compared to 155 per cent for all states. The improvement in income, therefore, was in multiples of the im-

provement in any of the independents postulated in causal relationship to per capita income. Of course, the entire level of economic activity rose 60 per cent[8] from 1940 to 1950, which emphasizes greatly the effects of dynamic influences on state per capita income, treated in a section below.

Measures of dispersion for all states, based on a mean computed from the ratios for each state, show highest coefficients of variation for X4, per cent population Negro, and X2, per cent employed labor force occupied in agriculture, forestry, and fisheries. The coefficients of variation were about 130 per cent and 70 per cent respectively. The coefficients of variation for the other two factors, X3 and X5, were about 10 per cent for both years. The coefficients of variation for per capita income were intermediate between the two extremes, being 37 per cent in 1940 and 23 per cent in 1950.

The coefficients of variation of two factors, per cent population employed and per cent population Negro narrowed during the 10-year period, while the other two variable factors, per cent employed labor force in agriculture and median years of schooling of males 25 years old and older[9] had an increase in relative variance. This means that the states became more alike with respect to the two former factors but more unlike in regard to the latter. The decline in the coefficient of variation of per capita income of 36 per cent from 1940 to 1950 is highly significant because it shows a sharp reduction of state differences.[10] This closing up relatively of state per capita income differences[11] at a time when both improvement in the independent factors and rise in economic activity occurred points up the importance of measuring the results of changes in the level of economic activity on state per capita incomes over time.

COMPARISON OF RESULTS OF REGRESSION ANALYSIS FOR 1940 AND 1950

Correlation analysis of independent factors against state per capita income for 1940 and 1950 separately resulted in coefficients of determination of 89 per cent and 84 per cent respectively, the 1950 measure of degree of association being slightly less (five points), although both coefficients were significant at the one

[8] Based on an increase in the industrial production index from 125 to 200.

[9] Quality differences are ignored for lack of a measure. Since the South has obviously lagged in quality of education, the lag was somewhat greater than indicated by the median years of schooling of working males.

[10] The relationship of the reduction in the disparity in basic factors between states at the same time that the per capita income differences declined should not go unnoticed. It may be stated thus: from 1940 to 1950 as the states became more alike in basic factors they also became more alike in per capita incomes.

[11] Lest there be over-emphasis on the "accordion effect" of changes in economic activity on the relative differences in income between economic units, it should be pointed out that the result is not the same in absolute differences. In fact the absolute differences, or actual dollar differences, widened during the period, which is shown by the fact that the standard deviation of state differences increased from $195 in 1940 to $317 in 1950, an increase of 63 per cent. This, however, was only 41 per cent as great a change as occurred in the means of all states for the two periods. The relatively greater increase in the means of all states from 1940 to 1950 compared to the respective standard deviations accounts for the decline in relative dispersion.

per cent point. In both years per cent employed labor force in agriculture and per cent population Negro were negatively associated with state per capita income while per cent population employed and median years of schooling were positively related. Despite differences in level of economic activity between the two periods, it is highly significant that the signs of the coefficients of the two sets of factors remained unchanged, although they increased in size substantially from 1940 to 1950. Per cent of population employed and per cent population Negro more than doubled their regression coefficients while per cent employed labor force in agriculture and median years of schooling had a rise in their respective coefficients of about one-third. All four independents were statistically significant at the one per cent point. Despite the sharp change in level of economic activity, the results fail to bear out the contention of Breimyer that some of the regression coefficients would be recast. See table 2.

In Figure 1 is shown graphically the relative importance of the factors. For each year the limits of each independent factor were determined by adding to and subtracting one standard deviation from the mean. The limits of the regression lines would thus account for about two-thirds of the effect of each factor on state

TABLE 2

Summary of Correlation Results with Four Factors on State Per Capita Incomes, 1940 and 1960

Factor	Unit	Net Regression Coefficient	Beta Coefficient
1940			
X_2. Per cent employed labor force in agriculture, forestry and fisheries*	1 per cent point	−5.032	−0.338
X_3. Per cent total population employed	1 per cent point	27.005	0.501
X_4. Per cent total population Negro	1 per cent point	−2.287	−0.154
X_5. Median years of schooling of all males 25 years old and over	1 year	55.604	0.215
$a = -\$691.50$			
$R^2 1.2345 = 0.8982$; $\bar{R}^2 1.2345 = 0.8889$; $\bar{R} 1.2345 = 0.9428$; $S 1.2345 = \$64.87$			
1950			
X_2. Per cent employed labor force in agriculture, forestry and fisheries*	1 per cent point	−6.511	−0.229
X_3. Per cent total population employed	1 per cent point	59.133	0.568
X_4. Per cent total population Negro	1 per cent point	−5.492	−0.208
X_5. Median years of schooling of all males 25 years old and over	1 year	73.739	0.242
$a = -\$1324.10$			
$R^2 1.2345 = .8526$; $\bar{R}^2 1.2345 = .8395$; $\bar{R} 1.2345 = .9162$; $S 1.2345 = \$125.67$			

* Per cent of employed labor force (excluding government employees) in agriculture.

NOTE: All factors are highly significant on the basis of the F-test. Highly significant means that the error mean square was so small relative to the variance associated with each factor that there is only one chance or less in 100 of a ratio that large having occurred by accident.

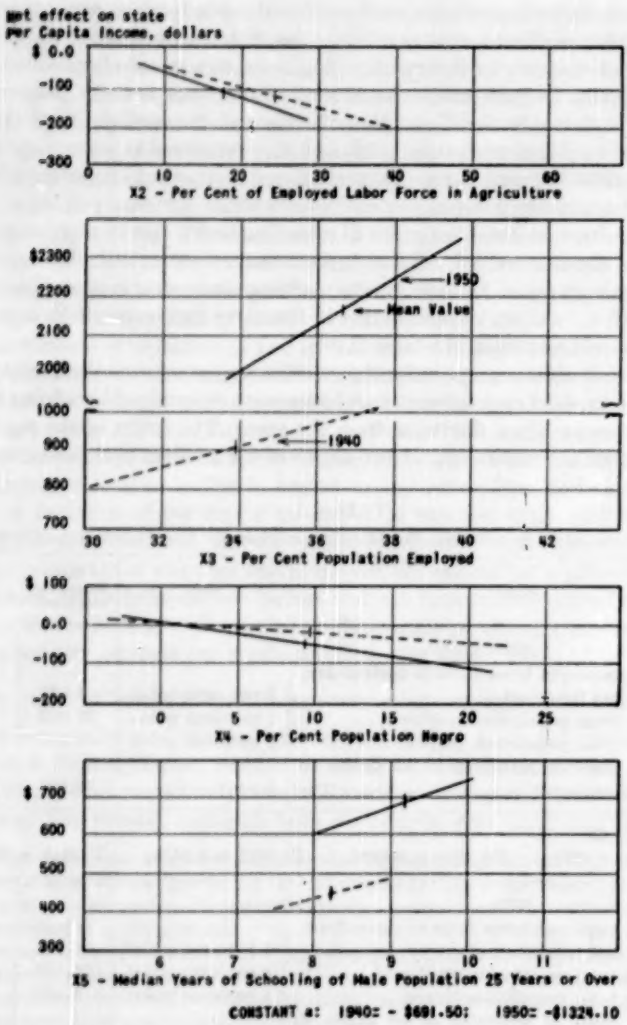

FIGURE 1. NET EFFECT OF FOUR FACTORS ON STATE PER CAPITA INCOME, 1940 AND 1950 COMPARED

The graph shows the effect on net per capita income of one standard deviation plus and minus the mean of each factor. The means of all factors and their respective standard deviations shifted from 1940 to 1950 toward less agriculture, higher percentage employed, lower percentage population Negro, and higher median years of schooling. It is to be noted that the regression effect increased the largest amount relatively for per cent population employed and for the median years of schooling.

per capita income. In the chart the broken line represents regression values for 1940, the solid line values for 1950. Note particularly how the limits of each factor shifted from 1940 to 1950 and how the regression line shifted either to the right or left. The change in the 67 per cent limit shows how each factor improved and how much effect this improvement had on per capita income. This can be illustrated with X3, which shows a mean value for 1940 substantially less than the mean value for 1950; in fact it is approximately one standard deviation lower than the mean for 1950. This difference provides us with a means by which to estimate approximately the effect of the improvement in the factors on the differences in state per capita incomes. In the case of X3, the improvement from 1940 to 1950, based on the horizontal shift of the means in the 10-year period, approximates an increase of $80 in per capita income. Proceeding similarly for the other three factors, we find the effects of the improvements in them to be as follows:

X2	$40
X4	zero
X5	$55

The composite effect (gross) of the improvement in all four factors on state per capita income differences, therefore, amounted to an increase of approximately $175 in 1950 per capita income over 1940 per capita income. Since the absolute increase was $825, the improvement in independent factors accounted for 21 per cent of the difference between 1940 and 1950. The unexplained difference was due to the change in the level of business activity and other factors. A factor for level of business activity will affect the results in two ways, through accounting for part or all of the unexplained increase in average per capita incomes for all the states and by absorption of some of the effects reflected in regression coefficients of the present four factors.

DYNAMIC ANALYSIS[12]

The analysis to this point has related variations in economic structure of geographic units to per capita income. Differences in state per capita incomes due to the relative importance of agriculture, population gainfully employed, racial composition of the population, and relative educational level are results of variations in economic structure. The basic characteristics of economic structure change slowly over time, with the possible exception of X3, the percentage of the population employed, which is responsive to the level of economic activity. The effects of these gradual changes over time have been measured approximately. It has been shown that only minor changes in state per capita incomes were caused by growth or progress of these factors in the 1940–1950 decade, the result not of

[12] For the purposes of this study, "dynamic" means the effects of variable factors on the dependent factor (state per capita income) over time. This is not a refined definition of course but it is easily understood. It contrasts with the analysis to this point in that time has been held constant. In the analysis which follows we treat two years together as a sample of a universe of a number of years.

the inherent nature of the factors but because of the slowly changing nature of them. This is the reason the 4-factors are referred to as the basic or "static factors."

Along with the striking changes in the relationship between states in per capita income in the 10-year period, there occurred also a sharp rise in the general level of per capita incomes. While the coefficient of variation of state per capita incomes narrowed from 37 per cent in 1940 to 23 per cent in 1950, the general level of state per capita incomes rose from $532 for all states in 1940 to $1,357 in 1950, an increase of 155 per cent.

The analysis at this point is concerned with the facets of changing state per capita incomes from 1940 to 1950, namely; (1) the shift in state relationships and (2) the general upward trend in the general level of state per capita incomes during the 10-year period. Since the sharp rise in the level of economic activity was the dominant economic characteristic of the period, we shall be concerned with the determination of its effects on both types of changes in per capita incomes.

Two recent approaches to analysis of this problem may be mentioned in passing. Professor Hanna[13] employed an index of sensitivity to show the response of per capita incomes to changes in economic activity. His time-factor index measured the effects of variations in economic growth and progress. The author[14] in the paper previously cited, used the index of the general price level to show the response of selected states to shifts in economic activity. It was felt at the time that this was a crude and inadequate approach because only the price effects of economic activity were measured. Moreover, since the index of wholesale prices is not computed separately by states it was of little value in studying state relationships. Therefore in order to meet both objections another measure of economic activity was sought which would reflect broadly and in a representative manner the variations in economic conditions of the different states.

The annual earnings of production workers in manufacturing was selected as the measure most nearly meeting these conditions.[15] The use of this measure in the analysis below does not mean that the author believes it is the best measure of the effect of economic activity on state per capita incomes over time. Rather its use in the regression analysis which follows is intended to point up the importance of this type of analysis, the possible value of such research, and the need for the development of more refined measures of economic activity by geographic areas.

The reasons annual earnings of production workers in manufacturing by states is considered a reasonably good measure of the general level of economic activity over time are now set forth.

Because of the strategic position occupied by manufacturing, particularly of

[13] Frank A. Hanna, "Cyclical and Secular Changes in State Per Capita Incomes, 1929-50," *Review of Economics and Statistics*, (Aug. 1954), pp. 320-323.

[14] John L. Fulmer, *op. cit.*, pp. 269-73.

[15] State data for 1940 on yearly earnings of production workers in manufacturing were obtained from the 1939 Census of Manufacturers by computation and then adjusted to the 1940 wage level. Monthly earnings of production workers in manufacturing for 1950, obtained from the *Monthly Labor Review*, were inflated to 12 months. Values for the few states missing for 1950 were obtained by interpolation to state relationships for subsequent years.

durables, during major changes in the business cycle, any measure of economic activity which is characteristic of the level of manufacturing activity should be satisfactory. It is assumed that earnings of production workers in manufacturing satisfactorily reflect trends in activity in manufacturing, since wages and salaries account for 65 per cent of all income distributed to this segment of the economy.[16] Moreover, not only does it measure the relative profitableness of manufacturing but it also reflects general economic activity because in manufacturing the wage level is the barometer of employment conditions, the availability of jobs and the ability of industry to pay for the needed workers. Furthermore, the status of manufacturing in this respect is broadly indicative of what is happening in the rest of the economy, since the cyclical ups and downs in commerce, transportation and communication are of about similar severity as in manufacturing.[17] It is peculiarly valuable also in reflecting institutional factors in the market for labor because it has been established that regional differences in wages tend to persist throughout the whole range of industries.[18]

The correlation analysis which follows has been made in two parts. First, there will be presented the results of the analysis designed to show the effect of annual earnings of production workers in manufacturing on differences in state per capita incomes for the two census years treated separately. This part of the analysis assumes that the pattern of earnings of production workers reflects in a limited way economic structure with impacts on the static relationship between state per capita incomes. Since the level of earnings of workers in manufacturing is a function directly of some of the static factors previously studied, such as race, educational level, and to some extent of relative percentages of population employed, and labor force in agriculture, regression coefficients of these factors will be affected. This part of the analysis will attempt to determine the effect of the new factor on state differentials, as well as the decline in them from 1940 to 1950.

The second aspect of the correlation analysis will deal with the effects of changes in the level of economic activity on state per capita income over time, the primary emphasis being on changes in state per capita incomes. The procedure will be to pool the two census years, combining them as a sample from a universe of a longer time interval, the purpose being to ascertain if the independent factors have value over time. Since time is no longer held static by isolated treatment of separate census years, the regression coefficients which result will be dynamic values only and therefore of applicability to any year.

The results of the first part of the analysis are given in Table 3. This table differs from Table 2 previously given in that it reports for 5 independent factors, representing the addition of X_6, average annual earnings of production workers

[16] It should be noted that the ratio given applies only to manufacturing. For the entire economy the wages and salaries paid production workers in manufacturing equalled only 22 per cent in 1950. Computed from data given in *A Supplement to the Survey of Current Business, National Income 1954 Edition*, pp. 177–179.

[17] W. S. Woytinsky and Associates, *Employment and Wages in the United States* (New York: Twentieth Century Fund, 1953), p. 57.

[18] Frank A. Hanna, "Contribution of Manufacturing Wages to Differences in Per Capita Income," *Review of Economics and Statistics*, (Feb. 1951), p. 28.

TABLE 3

Summary of Correlation Results with Five Independent Factors on State Per Capita Incomes, 1940 and 1950

Factor	Unit	Net Regression Coefficient	Beta Coefficient	Coefficient of Separate Determination (Per Cent)
1940				
X_2. Per cent employed labor force in agriculture, forestry and fisheries*	1 per cent point	−4.932	−.380	31.7
X_3. Per cent total population employed	1 per cent point	23.733	.440	33.1
X_4. Per cent total population Negro	1 per cent point	−.736	−.050	1.8
X_5. Median years of schooling of all males 25 years old and over	1 year	35.594	.137	9.0
X_6. Average annual earnings of production workers in manufacturing	$1	0.191	.231	16.1
$a = -\$653.79$				
$R^2_{1.2\ldots6} = .9172$; $\bar{R}^2_{1.2\ldots6} = .9076$; $R_{1.2\ldots6} = .9528$; $S_{1.2\ldots6} = \$61.36$				
1950				
X_2. Per cent employed labor force in agriculture, forestry and fisheries*	1 per cent point	−6.515	−.229	14.8
X_3. Per cent total population employed	1 per cent point	53.667	.515	40.6
X_4. Per cent total population Negro	1 per cent point	−3.804	−.144	6.3
X_5. Median years of schooling of all males 25 years old and over	1 year	36.045	.119	8.1
X_6. Average annual earnings of production workers in manufacturing	$1	.182	.251	18.1
$a = -\$1{,}332.82$				
$R_{1.2\ldots6} = .8794$; $\bar{R}_{1.2\ldots6} = .8597$; $R_{1.2\ldots6} = .9272$; $S_{1.2\ldots6} = \$116.29$				

* Per cent of total labor force, after excluding government employees, employed in agriculture, etc.

NOTE: All regression coefficients are statistically significant at the 1 per cent point by *F*-ratio tests.

in manufacturing. The purpose of this phase of the analysis is to determine if X_6, a factor of rapidly changing character introduced to reflect changes in the economy, has also static effects on state per capita income differences. The results show that X_6 does not add greatly to the overall state differences. This is shown by the fact that the coefficient of determination for both years increased by roughly two points as a result of the addition of X_6. Compare to Table 2.

However, when X_6 is considered independently relative to the other 4 factors it looms much more important. Measured either in terms of the Beta coefficient or the coefficient of separate determination, it is found that X_6 ranked third in 1940 and second in 1950 in the degree of association with state per capita differences. The reason why there is greater association with the factor considered independently than on the basis of the overall is because of intercorrelation of

X_6, the annual earnings of workers in manufacturing, with that of the other four factors. This intercorrelation is shown in two ways—by the reduction in the regression coefficients of the 4 basic factors as a result of inclusion of X_6 and by the coefficient of simple correlation between it and each of the other factors. By either basis it appears X_6 was most strongly intercorrelated with X_5, for the regression coefficients of X_5 were reduced 36 per cent in 1940 and 51 per cent in 1950 and the simple coefficient of correlation was .728 and .487 respectively. The intercorrelation of X_6 with X_4, percentage of population Negro, was practically as high as X_5, but the much lesser absolute change in the regression coefficients indicate a much smaller contribution to the regression coefficient and relative importance otherwise of X_6.

The high relationship between X_6 and X_5 is not unexpected because of the generally accepted connection between educational level of workers and their productivity which in turn is related to the rate of pay. Since the coefficient of correlation between X_6 and X_5 declined from .728 in 1940 to .487 in 1950, it is indicated that employers were placing much less importance on educational level of workers as a basis of employment in 1950 than in 1940.

The comparatively high inverse correlation between X_6 and X_4, percentage of the population Negro, $-.602$ in 1940 and $-.520$ in 1950, is due to the fact that Negroes tend to be employed in industry in the lower paying jobs and to the pressure of a relatively large number of Negroes on the labor market. The decline in the degree of relationship from 1940 to 1950 indicates some improvement in the conditions of employment of Negro workers.

There was also some intercorrelation between X_6 and X_3, per cent of the total population employed, because the ability of a high percentage of the population to obtain work is related to employment opportunities which is reflected in the strength of employment in manufacturing and its bidding for workers, as shown by the level of earnings of production workers in manufacturing. The decline in the size of the regression coefficient of X_3 indicates a significant contribution of this factor to the relative importance of X_6 on state per capita income differences.

The intercorrelation between X_6 and X_2, percentage of the labor force (excluding government workers) employed in agriculture, was about as strong inversely as the relationship between X_6 and X_3. This is explained on the grounds that industrial prosperity, reflected by the earnings of production workers in manufacturing, and agricultural prosperity are closely related. Industry is largely responsible for the strength of demand for agricultural products, directly by the demand for raw materials for use in manufacturing and indirectly by demand for food of its workers through wage payments.

The second general problem related to this part of the correlation analysis on structural relationships for two years was the decline in the relative dispersion of state per capita incomes from 1940 to 1950. The conclusion from the data given in Table 3 is that there was no effect from X_6 on the decline in relative income differentials from 1940 to 1950. There are apparently two main reasons—one statistical and the other causal. The statistical reason is due to the fact that the regression equation assumes a linear function and is in terms of absolute

dollar changes, while the decline in relative dispersion was a change in the coefficient of variation from 1940 to 1950 (a measure of dispersion in percentage terms). This is to be contrasted with the fact that the standard deviation of the dispersion of state per capita incomes increased from $195 in 1940 to $317 in 1950, an increase of 63 per cent, which however was significantly less than the increase in the mean of state per capita incomes in the same period.[19] As set up, the statistical analysis explains away the standard deviation of the states, not the coefficient of variation. The problem might be more efficiently solved by using some function other than linear for X_6 which, however, complicates the multivariate analysis with the other factors which have linear functions. It is seen from this that a great deal of work needs to be done on the statistics of the problem.

The other reason why the regression analysis failed to explain away part of the decline in relative dispersion of state per capita incomes from 1940 to 1950 is more basic. It is that some of the causal factors producing this effect (popularly referred to as the "accordion effect") are absent from the regression equation. These factors are associated with the economic evolution of the respective economies of the different states. Hanna[20] has shown that the decline in relative dispersion of state per capita incomes was due about equally to the sensitivity of state per capita incomes to changes in national per capita income and to the time-factor index. The sensitivity index measures the degree of response of a state's per capita income over time to a unit of change in national per capita income, while the time-factor index measures the effect on state per capita income of growth and development of a state's economy, representing a more complete and efficient exploitation of economic resources, in the case where the state is in the beginning stage of economic evolution; and conversely for the state with a declining economy.

The above analysis, a matter of comparative statics, has been concerned with comparisons of regression coefficients of factors for two census years treated separately. In the second part of the analysis which now follows, both years are pooled in one regression analysis in order to calculate regression coefficients which will be timeless, that is, of value for analytical and forecasting purposes irrespective of the year. The results will enable determination of state per capita incomes first and state per capita differentials secondly, as the result. It becomes a dynamic analysis in that regression coefficients are determined for a set of factors which explain variations of the dependent factor over time. The same five independent factors are included as were dealt with in Table 3, only they are pooled with respect to time. The results of the analysis are given in Table 4. The data indicate a high degree of success in explaining state per capita incomes over time on the basis of a sample drawn from one universe. The result is that the coefficient of determination rose to 95 per cent as compared to 89 and 84 per cents respectively for 1940 and 1950. X_6, the earnings of production workers in

[19] See footnote 11 above.

[20] *Ibid.*, "Cyclical and Secular Changes in State Per Capita Incomes, 1929–50," pp. 320–1, 324–5, and 328.

TABLE 4

Summary of Correlation Results with Five Factors on State Per Capita Incomes, 1940 and 1950 Treated Compositely

Factor	Unit	Net Regression Coefficient	Beta Coefficient
X_2. Per cent employed labor force in agriculture, forestry and fisheries*	1 per cent point	−4.411	−.124
X_3. Per cent total population employed	1 per cent point	34.247	.250
X_4. Per cent total population Negro	1 per cent point	−0.654	−.017
X_5. Median years of schooling of all males 25 years old and over	1 year	25.672	.054
X_6. Average annual earnings of production workers in manufacturing	$1	0.360	.716

$a = -\$1{,}128.10$

$R^2 1.2\ldots6 = .9515$; $R^2 1.2\ldots6 = .9489$; $R 1.2\ldots6 = .9741$; $S 1.2\ldots6 = \$110.29$

* Per cent of total labor force employed after excluding government employees.

NOTE: All regression coefficients are statistically significant at the 1 per cent point by *F*-ratio tests.

manufacturing, now becomes by far the most important factor, reducing the size of the other four regression coefficients which, however, remained statistically significant at the one per cent point.

Because of even greater intercorrelation than shown above between X_6 and the four basic factors, the regression analysis resulted in a sharp re-evaluation of the regression coefficients of the 4 original factors. Coefficients which were associated with state per capita income differentials for one year have now become "dynamic factors" for explaining variations in state per capita incomes over time. Although, as shown in Table 4, the signs of the regression coefficients remained unchanged, the value of each coefficient was reduced compared to either the 1940 or 1950 values given in Table 3. Compared to the 1950 regression coefficients, X_2 was reduced 32 per cent, X_3 36 per cent, X_4 83 per cent, and X_5 29 per cent; compared to the 1940 values of the regression coefficients the reductions were materially less because the 1940 values of the factors except for X_5 were greatly smaller than the 1950 values. However, of the four basic factors, only X_3, per cent population employed, remained larger than the 1940 values after re-evaluation. It is to be noted that the regression coefficient of X_6 was doubled in size approximately by pooling the two years, as compared to either its value in 1940 or 1950. This change points up the great importance of X_6, as a dynamic factor in explaining variations in X_1 over time.

Despite these reductions all four factors remained statistically significant and, with the exception of X_4, per cent population Negro, of sufficient size to have a measurable effect on state per capita incomes. For preparation of estimates of per capita income for any year, in a dynamic sense, the regression coefficients show that one point reduction in per cent of the employed labor force in agriculture was associated with $4.41 increase in state per capita income, a point

increase in percentage of population employed with $34.25 increase, and one year rise in the median years of schooling of males 25 years old and over with $25.67 income, while $1 increase in the earnings of production workers in manufacturing was related to an increase of $0.36 in state per capita income, twice the effect shown in Table 3.

A measure of the overall significance of the correlation analysis is indicated by the degree of success in estimating the original state values from the 5-factor regression equation. Using the mean error of estimate as the measure of efficiency of the regression equation, it is found that the 1940 original state per capita incomes can be estimated with 9.6 per cent discrepancy and 1950 with 7.0 per cent error, the composite error for both years being 8.3 per cent. Except for six states[21] which showed large percentage errors, the results suggest that it may be possible with further refinements in the regression equation to estimate directly by regression methods the per capita income of not only states for any given year but also of geographic units of sizes different from the states. In order to accomplish this very desirable goal within satisfactory error limits, previous research indicates the need for: (1) further refinement of factors, (2) replacement of present linear functions perhaps by more complex functional relationships, and (3) the addition of a factor to reflect high income groups similar to the reflection of low income groups in current equations through the measure used for the relative importance of agriculture.

SUMMARY AND CONCLUSIONS

Since the 1950 census data have become available, it is possible to extend greatly the analysis of state per capita income differentials for 1940, published previously.[22] The main conclusion from comparisons of the results from analysis of four basic factors against state per capita incomes for 1940 and 1950 is that the earlier findings for the static, or one year situation, are confirmed. In general the regression values were raised from 1940 to 1950 but the coefficient of determination was less by about 5 points. None of the signs of the regression coefficients were changed or materially recast as Breimyer[23] indicated would happen in an earlier paper, although the relationships have perhaps not been put to the severe tests of a serious depression which might change some of the signs of the coefficients, particularly that of the one for agriculture.

All four factors changed from 1940 to 1950, toward less agriculture, greater percentage of people employed, relatively fewer Negroes, and a higher level of education. The coefficients of variation showed that the states became slightly less alike in agriculture and educational level and considerably more alike in per cent population employed and the percentage of the population Negro. The net effect of the trend in the factors was an increase in the level of state per capita incomes of $175.

[21] Mississippi, Arkansas, Michigan, and Oregon in 1940, and Delaware and Kentucky in 1950.

[22] John L. Fulmer, *op. cit.*

[23] Harold F. Breimyer, *op. cit.*

The section on dynamic analysis involved two different problems. First, a factor to represent level of economic activity was included with the four factors in an analysis of the two years separately for purposes of comparative statics. The new factor X_6, average annual earnings of production workers in manufacturing, raised the coefficient of determination by about 2 points for each year, indicating that it had about the same effect on state differences in both years. In terms of individual relationships between the regression coefficients, it was found that X_6 was however much more important than this change in the overall coefficient of determination due to the fact that it was intercorrelated with most of the other factors, most highly with X_5, educational level. Taking into account the net effects of individual factors, X_6 proved to be the third most important factor explaining state differences in 1940 and a close second with X_2 in 1950. However, X_6 was not importantly related to the decline in relative dispersion of state per capita incomes from 1940 to 1950. The reason was to some extent a statistical one but more largely due to the fact that other more basic factors, not included, were responsible.

The dynamic analysis, which pooled both years as a sample of a universe of a longer period of time, produced more satisfying results. The coefficient of determination was raised to 95 per cent, compared to 91 per cent for 1940 and 86 per cent for 1950. While all coefficients except X_6 were sharply re-evaluated because of strong intercorrelation in the pooled analysis, all remained statistically significant. The regression coefficient of X_6 was doubled over either value for 1940 or 1950 and became the most important factor by far. The new values of all variables are entirely dynamic functions, having lost all static functions in the pooled analysis. The new values were employed to estimate the original per capita incomes for 1940 and 1950 with errors of 9.6 and 7.0 per cents, respectively.

The conclusion is that the procedures, in addition to throwing further light on the nature of state per capita incomes, both statistically and dynamically, hold promise for preparing estimates of per capita incomes for states and for minor geographic areas. This would require further refinements of the functional nature of the regression relationships and the addition perhaps of two more variable factors to represent (1) the high income groups and (2) trends in economic development.

A REAPPRAISAL OF F.O.B. PRICING AND FREIGHT ABSORPTION*

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I. THE CASE FOR STOCK TAKING

A distinguished economist once began a book with the conventional disclaimer that he had little to say that was really original. But he added rather aggressively that anything very original in our subject was probably wrong. I cite his observation both to excuse the absence of novelty in this paper and to exact some modicum of comfort from the deficiency. In the following ruminations on freight absorption, f.o.b. pricing, and phantom freight, my object is neither reconstruction nor refutation—only commentary.

In the last two decades, the study of geographical discrimination has claimed the attention of many able scholars: to name only a few—Frank A. Fetter,[1] George W. Stocking,[2] Arthur Lewis,[3] George J. Stigler,[4] Arthur Smithies,[5] Fritz Machlup,[6] Carl Kaysen,[7] and J. M. Clark.[8] Yet since the recent court decisions against base pricing, geographical discrimination as manifested in freight absorption and phantom freight has inspired little new interest. Before it joins bimetalism and the compensated dollar I believe that one more survey of the relevant critical thought may be in order.

II. DISCRIMINATION IN THE SIMPLEST CASE

Just as the treatment of imperfect competition until recently was generally back-handed and unsystematic, so formerly not much attention was paid to the influence of delivery costs on price policies. Earlier writers knew well enough that impersonal price making required markets of considerable extent; and that transport charges, more than anything else, limited the extent of the market and, hence, the force of competition. Earlier writers were, of course, familiar with the role of arbitrage in organized markets. Yet, so far as I know, Frank A.

* Paper delivered at the Twenty-fourth Annual Conference of the Southern Economic Association, Biloxi, Miss., October 20, 1954.

[1] *The Masquerade of Monopoly* (New York, 1931); "The New Plea for Basing Point Monopoly," *Journal of Political Economy*, Vol. 45, No. 5 (Oct. 1937), pp. 577–605.

[2] *Basing Point Pricing and Regional Development* (Chapel Hill, 1954).

[3] *Overhead Costs: Some Essays in Economic Analysis* (London, 1949).

[4] "A Theory of Delivered Price Systems," *American Economic Review*, Vol. 39, No. 6 (Dec. 1949), pp. 1143–1159.

[5] "Aspects of the Basing Point System," *American Economic Review*, Vol. 32, No. 4 (Dec. 1942), pp. 705–726; "Monopolistic Price Policy in a Spatial Market," *Econometrica*, Vol. 9, No. 1 (Jan. 1941), pp. 63–73.

[6] *The Basing-point System* (Philadelphia, 1949).

[7] "Basing Point Pricing and Public Policy," *Quarterly Journal of Economics*, Vol. 63, No. 3 (Aug. 1949), pp. 289–314.

[8] "Basing Point Methods of Price Quoting," *Canadian Journal of Economics and Political Science*, Vol. 4, No. 4 (Nov. 1938), pp. 477–489.

Fetter was the first author to set forth explicitly the price relationships which will prevail in markets characterized both by impersonal pricing and delivery costs.[9] Fetter reiterated that, in such markets, the price of the product at two points could not differ by more than the cost of delivery between them. But he stressed that this condition did not require a continuous gradation of prices from the highest to the lowest price market; that is, he corrected the popular notion that the world price of wheat was set in Liverpool; and that the price of wheat in Kansas was equal to the Liverpool price minus transportation to that port. As he demonstrated, price relationships over the world depended upon the distribution of wheat surplus and deficit areas. So far as any one producer was concerned, however, price was strictly f.o.b. and in no wise dependent upon the ultimate destination of shipment.

Fetter was led to the study of geographical discrimination by his abomination of the United States Steel Corporation. His vehement opposition to Pittsburgh Plus was, I suspect, a sort of derived hostility. He inveighed against the basing point system in steel on three main counts. It was conspiratorial—and hence illegal. It gave the Pittsburgh area an unfair commercial advantage. And it permitted and encouraged cross-hauling which he viewed as an unmitigated waste of railway labor and rolling stock. His solution was, of course, compulsory mill pricing and—if possible—the breaking up of the giant company.

The second main step in the study of geographical discrimination we owe to H. W. Singer, A. P. Lerner[10] and W. A. Lewis.[11] These writers employed a model of the simplest sort. By their assumptions customers were evenly distributed through space, all firms had identical cost functions, the freight rate was uniform per unit of distance, and firms were free to both enter the industry and to change their locations. On these assumptions, it was shown that long-run equilibrium required three things. First, all firms must be located at equal intervals from their nearest rivals. Second, each firm has an exclusive market area—except for those customers who might be located equidistant from two or more firms; the market area for the firm is a hexagonal pattern. Third, the equilibrium firm operates at a rate of output where average manufacturing cost is falling. If this last condition is not met, a new firm can insert itself in between two established companies and profitably produce at a lower rate of output. In the complete absence of overhead costs, the industry would presumably have as many sellers as buyers.

Singer, Lewis and Lerner did not directly consider whether, on their assumptions, the firm would price f.o.b. or practice discrimination. It remained for Arthur Smithies to put the price policy of their monopolist under the microscope. He performed this task in the 1941 volume of *Econometrica* with the aid of the mathematician L. J. Savage and a fearful display of symbols.[12] Smithies retained

[9] "The Economic Law of Market Areas," *Quarterly Journal of Economics*, Vol. 38, No. 2 (May 1924), pp. 520–529.

[10] "Some Notes on Duopoly and Spatial Competition," *Journal of Political Economy*, Vol. 45, No. 2 (Apr. 1937), pp. 145–186.

[11] *Overhead Costs*, pp. 116–127.

[12] "Monopolistic Price Policy in a Spatial Market," *Econometrica*, Vol. 9, No. 1 (Jan. 1941), pp. 63–73.

the assumptions of the earlier writers, including that which gave the firm the same demand curve at every point. But geographical discrimination emerged in his paper as a function of the derivative of delivered price with respect to the logarithm of quantity.

Actually, Smithies and Savage did their job the hard way. So far as I can judge, they were merely relating the monopolist's price policy to the respective slopes of the marginal revenue and average revenue curves.

It has become customary to depict marginal revenue as always falling more rapidly than average revenue. I am not sure why this is so. Possibly it is because Professor Chamberlin first drew the marginal revenue and average revenue curves in this way.[13] (Incidentally, Mrs. Robinson did not.[14]) Possibly it is because of the convenience of drawing straight line demand curves on the blackboard. Diminishing demand, however, is compatible with four other varieties of marginal revenue curve.

(1) Marginal revenue may decline less rapidly than price at each rate of output, *e.g.*, as when demand is "uniformly elastic."

(2) Marginal revenue and price may decline with equal rapidity at each rate of output.

(3) Marginal revenue may increase as price falls, being negative at low rates of output, positive at high rates of output. This type of marginal revenue curve is implicit in any demand function for which elasticity increases as price falls.

(4) Marginal revenue is negative at all prices but approaches zero as price falls, *e.g.*, as when demand is "uniformly inelastic."

Perhaps the easiest way to visualize the price policy of the firm in spatial competition is with reference to the case where constant costs prevail; so that, regardless of the magnitude or distribution of total output, the marginal cost of serving a distant customer always exceeds the marginal cost of serving an f.o.b. customer by the cost of delivery between them.

If marginal revenue declines more rapidly than price at each rate of output, then the firm maximizes profit by absorbing freight; that is, delivered prices in the two markets will differ by less than the cost of delivery between them. If the marginal revenue and average revenue curves are parallel, the firm has no incentive to discriminate and, hence, will price f.o.b. If marginal revenue declines less rapidly than price at each rate of output, the firm would prefer to exact phantom freight, that is, to maintain a spread in delivered prices greater than the cost of delivery between two markets.[15]

Smithies rules out this last possibility by making arbitrage eliminate any

[13] *The Theory of Monopolistic Competition* (Cambridge, 1947), pp. 74–76.

[14] *The Economics of Imperfect Competition* (London, 1934).

[15] These propositions also hold if one drops the assumption of constant costs; but, of course, the graphical analysis is not applicable to increasing and decreasing costs situations since cost in one market perforce depends upon the rate of delivery to all other markets. A condition of profit maximization for selling in two markets, however, is that marginal revenue in the distant market must exceed marginal revenue in the near market by the cost of delivery between them; and marginal manufacturing cost at any rate of output is independent of how the product is distributed spatially.

difference in delivered prices above the delivery charge. But if one is dealing with monopoly pricing, there is, I believe, no good *a priori* reason for excluding phantom freight. For if the firm can influence price by varying output, there is no necessity for placing it at the mercy of arbitragers.

The introduction of rising marginal revenue curves would complicate the analysis without shedding new light. Suffice it to say that, if marginal revenue is negative at low rates of output, the firm maximizes by restricting sales to one unit in each market.

With Smithies' article, the theory of spatial competition in the simplest case is substantially complete. This theory—notwithstanding its austere assumptions is—I believe—useful for pointing up two truths often neglected.

The first is that when delivery expenses are present in an industry, some departure from mill pricing is virtually certain. There are, in fact, only two situations in which discrimination does not pay. The first is where, as in wheat production, large numbers of buyers and sellers are in relatively costless communication with one another. The second is Smithies' case where the producer wishes to exact phantom freight from his more distant customers but is compelled by arbitrage to settle for the next best thing—mill pricing. Clearly most industries do not fall into either category. Hence we may properly be suspicious of pricing which purports to be f.o.b. As in the book trade, the charge for handling probably conceals some discrimination for or against outlying customers.

The second truth underlined by the simplified theory of spatial competition is that freight absorption is not evidence of such monopoly power. If we drop the premise that a producer everywhere faces the same demand curve, then freight absorption becomes a rather reassuring sign. One only has cause for alarm when the firm habitually defies arbitrage by exacting phantom freight, or by actually charging nearer customers more than distant customers.

III. BASE PRICING

Yet if the foregoing analysis indicates the improbability of mill pricing in a world of delivery expenses, it also allows no place for basing point systems of price quoting. For such systems are too crude to permit profit maximization on anything approximating *ceteris paribus* assumptions.

At this point, it may be well to stress that many basing point systems have not much in common except the name. For example, one frequently cited member of the specie was the policy formerly employed by suppliers of maple flooring. In this industry delivered prices throughout the country were quoted f.o.b. plus transportation from Cadillac, Michigan. But of the seventeen mills co-operating, sixteen were located within a two hundred mile radius of Cadillac; and thirteen were no more than 75 miles from the basing point.[16] What actually prevailed could, I think, more accurately be described as a close approximation to collusive f.o.b. selling.

Again, in the multiple plant firm, freight absorption is inevitable whenever

[16] A map showing the distribution of maple flooring mills in the early nineteen twenties is reproduced from court records (268 U. S. Record, Vol. 1, p. 112) in F. A. Fetter, *The Masquerade of Monopoly* (New York, 1931), p. 232.

some plants operate below capacity. The firm will presumably seek to arrange production so that the cost of filling an order is minimized; and, assuming sales managers revise their price lists only infrequently, this ordinarily entails using some mill as a basing point. When the base is the mill located nearest to the customer, this type of freight absorption goes under the name of freight equalization.

But the basing point systems that have received the most attention are those where widely separated firms use the same point for quoting delivered prices. Over the years several different explanations have been offered for this phenomenon—generally with reference to the steel and cement industries.

The thesis that has gained the widest currency we owe to Stigler[17] and John Maurice Clark.[18] By their analysis, base pricing is a product of the following circumstances. Profit sharing among firms is impossible. Local demand for the commodity is more unsteady than over-all demand. Firms are few; and the product is not easily stored.

If unabashed collusion were possible, the firms could pool orders and earnings, practice a nicer discrimination than a basing point permits, and eliminate cross hauling by assigning orders to the most appropriate mills. If regional demand were stable, the firms would divide the market, each firm being content to cultivate its own backyard. If the commodity could be stored, in times of poor trade the firms would have less temptation to absorb freight in order to dispose of outputs. But when producers are deprived of pooling, storage, and certainty, they reduce uncertainty by cultivating more distant customers even though it means sacrificing the short-run profits that could be had by giving more attention to near customers.

Stigler's version of this thesis contains the rather surprising assertion that there is no reason for believing cross hauling to be an inherent feature of base pricing; and that there is no empirical data to show that it is. This contention has been sharply challenged by b. .h McGee[19] and Stocking[20] who cite convincing evidence that extensive cross hauling formerly accompanied the use of base pricing in steel and cement.

Personally, I think Stigler was offering an unnecessary and misleading dictum. To be sure, by freight absorption two firms can distribute their total outputs more evenly through space without cross hauling. But if their object is to seek long-run profits at the sacrifice of short-run profits, there is no reason why they should refrain from cross hauling. Indeed the principal merit of the Stigler-Clark thesis is, I believe, that it convincingly explains why cross hauling does occur.

As a second possibility, base pricing may be viewed as simply a workable method of restraint—but one in no sense made "inevitable" by the conditions of

[17] "A Theory of Delivered Price Systems," *American Economic Review*, Vol. 39, No. 6 (Dec. 1949), pp. 1143-1159.

[18] "Basing Point Methods of Price Quoting," *Canadian Journal of Economics and Political Science*, Vol. 4, No. 4, (Nov. 1938), pp. 477-489.

[19] "Cross Hauling—A Symptom of Incomplete Collusion under Basing-Point Systems," *Southern Economic Journal*, Vol. 20, No. 4 (Apr. 1954), pp. 369-379.

[20] *Basing Point Pricing and Regional Development* (Chapel Hill, 1954), pp. 129-138.

the trade. Conceivably, the industry could have hit upon other and more profitable ways of inhibiting competition. But base pricing was evolved and found to have the considerable merits of being easily policed, easily revised, and, until recently, legal.

Finally, following Fetter, one may regard base pricing as a type of industrial coercion. The dominant firm selects a price pattern which serves its purpose. Smaller rivals follow suit in the knowledge that any deviation on their part will bring brutal retaliation. Thus it is often maintained that Pittsburgh Plus originally made possible the profitable use of the high cost capacity of the U. S. Steel Corporation in Pittsburgh. Professor Stocking, in his recent book, apparently accepts this view; but he estimates that a mill price differential between Pittsburgh and Birmingham was maintained for some years after it served the interests of the company.[21]

For my own part, I believe that there is enough variety in systems of base pricing that an all-embracing theory of the phenomenon is not possible. Base pricing may be rooted in the clustering of firms, in the dominant position of one firm, or in the inability of oligopolists to find a better hole. Or it may represent the influence of any combination of these predisposing factors.

IV. DISCRIMINATION AS A POLICY PROBLEM

To sum up, then, the main conclusion yielded by this brief survey is that different firms practice price discriminations for different reasons. But if this proposition is valid, one may fairly decline to give a yes or no answer to the policy question: should mill pricing be made compulsory? Probably most economists would agree that a *prima facie* case for compulsory mill pricing exists whenever it can be shown that discrimination aids restriction.

Such a case is easily made whenever base pricing is employed. Here discrimination is inextricably bound up with collusion. The presumption must be that base pricing is less restrictive than formal profit sharing; nevertheless, since the industry prefers collusive freight absorption to collusive mill pricing, the latter is presumably less restrictive than the former. Admittedly, when numbers in the industry are few, tacit or overt collusion is inevitable; but, fortunately, not all collusive measures are equally restrictive. The object of policy is to see that in oligopoly situations, the industry is compelled to settle for the least attractive measures.

Where rival firms are absorbing freight without much discernible co-operation the presumption must be against a legal ban on discrimination. As Kaysen has stressed, in these situations, uncertainty about a rival's behavior enters the picture in two places—in the setting of his ostensible f.o.b. price and in the discrimination he practices.[22] Compulsory mill pricing would remove one element of doubt in the game and, hence, make it easier for competing firms to dampen down rivalry.

One may, of course, argue—as does Stocking—that when an industry is em-

[21] *Ibid.*, pp. 71–74.

[22] "Basing Point Pricing and Public Policy," *Quarterly Journal of Economics*, Vol. 63, No. 3 (Aug. 1949), pp. 289–314.

ploying collusive base pricing the correct remedy is not compulsory mill pricing involving yet another extension of the federal power but rather trust-busting.[23] Politics, however, is at most the science of the second best; so that, for the present collusive mill pricing is probably the only alternative to collusive base pricing in industries such as steel and cement.

Over the years reasons other than the confounding of collusion have been advanced for striking down geographical discrimination. It has been urged that freight absorption provides the strong firm with the whip hand over weaker rivals who are largely dependent upon local markets.[24] One can certainly cite instances of predatory price cutting at the local level. Nevertheless, such discrimination has been palpably illegal since the Clayton Act; and over the last thirty years the Federal Trade Commission has apparently received few complaints alleging such behavior. Then again, price discrimination may be condemned because it allows cross hauling which compulsory mill pricing might reduce. Since some cross hauling is inevitable in a competitive industry, I cannot grant that the elimination of cross-hauling by itself is sufficient reason for banning freight absorption. Finally, of course, geographical discrimination may be deplored as simply unfair to particular customers or localities. Favored parties receive a cost advantage by virtue of their location wholly unrelated to efficiency. On this point, I cannot see that there is much to say except that, as Frank Knight used to observe: we do not live in a just world.

The conclusions of this paper have, then, no more claim to originality than its contents. They are simply that discrimination is properly suspect only when it is an integral part of collusion, whether overt or tacit; and that, since some departure from f.o.b. pricing is a necessary by-product of workable competition, nothing much is to be gained by attempting to eliminate non-collusive freight absorption or phantom freight.

[23] *Ibid.*, pp. 190–194.

[24] See, for example, the argument in Fritz Machlup, *The Basing-point System* (Philadelphia, 1949), pp. 23–24.

THE NEW THREAT OF SYNTHETIC TO NATURAL RUBBER

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INTRODUCTION

Testifying before a U. S. Senate Committee, Secretary of State Dulles urged in the strongest terms that the synthetic rubber industry, built during the war and now owned by the American Government, should be sold to private interests as soon as possible to remove a "source of friction" between the United States and her allies.[1] Nor is it any secret that the Government operation of this industry, from its incipiency during World War II, has been a "source of friction" *vis a vis* Great Britain, Holland and the sovereign communities of the Far East who participate in the production of natural rubber. Natural rubber producers have welcomed the U. S. Government's decision to sell its synthetic rubber plants, and foresaw this development as a reason for new optimism concerning their business prospects.[2]

Self-evidently, the *existence* of a synthetic rubber industry is to the disadvantage of the natural rubber producers and would remain so no matter whether the synthetic operation was in the hands of Government or of private industry. Why then should the natural rubber producers have so consistently pressed for transference of the American industry from Government to private ownership? The arguments which have been made publicly by these natural rubber producers have sounded off the slogans of anti-socialism, but it would be safe to discount the significance of pure anti-socialist sentiment and to suppose that their opposition to the Government operation of the American synthetic rubber plants has had roots in self-interest, and that the foreign offices that gave diplomatic voice to this opposition were similarly motivated.

This essay is concerned with two questions. First, why have the natural rubber producers pressed for the transference of the synthetic rubber industry from Government to private hands, i.e., what have they expected to gain by the change? And second, what changes in the economic position of the natural rubber producers can actually be expected to follow from the transference of the synthetic rubber industry into private ownership?

BACKGROUND TO THE PROBLEM[3]

The production and export of natural rubber has been and remains a prime source of dollar income to the sterling area, and a main prop of the economies of

[1] *Daily Congressional Record*, July 21, 1953. The statement was featured in a full-page advertisement by the Natural Rubber Bureau in the New York *Times*, Aug. 16, 1953.

[2] Cf. New York *Times*, Oct. 16, 1953, p. 35L.

[3] For further background material see the author's article, "The Sale of the Synthetic Rubber Plants," *The Journal of Industrial Economics*, Nov. 1953, and his Ph.D. disserta-

South East Asia. During World War II, the principal areas producing natural rubber were conquered by the Japanese and consequently the supply of rubber to the allies was cut off. In order to create an alternative source of this vital material, the U. S. Government was obliged, at great cost in money and critical materials and skills, to create a major new industry on American soil. When war was ended, it became the official position of the American Government that while the new synthetic rubber industry might not be able to compete cost-wise with natural rubber, it was too vital strategically to be abandoned, hence the Government must continue to keep a portion of the plants in operation as a nucleus for a rapid re-expansion of output. To accomplish this a minimum level of domestic consumption of the synthetic product would be enforced if necessary. The remainder of the (efficient) plants were to be kept in "mothballs."[4]

The post-war production of natural rubber was beset with many difficulties. The plantations had to be rehabilitated. Nationalist-revolutionary movements swept the area causing, in some instances, the expulsion of the colonial power. Synthetic rubber, a new competitor with technical potentialities that were hard to assess, had already preempted a share of the rich American market. The triumph of communism on the bordering China mainland increased the possibility of the further spread of communism with a consequent possibility of expropriation of European and American investment in the rubber producing territories, and these territories became evidently vulnerable to quick conquest in the advent of another world war.

At the onset of World War II, it had appeared that great economies could be expected in the production of natural rubber through a thorough rationalization of the industry, i.e., the concentration of production in low cost areas rather than the quota-control of output which preserved the market share of the high cost producer, and through the extensive replanting of the newly developed high-yield rubber trees. But these things required a considerable slowly-maturing investment. For the reasons already indicated, during the years that followed the end of World War II, European and American investment was reluctant to enter into the long term development and expansion of rubber-culture.

Nevertheless, the post-war operation of the rubber plantations has been by no means unprofitable. Rubber producers benefited from the universal commodity shortage during the period of world reconstruction. Thus in spite of widespread post-war estimates, reiterated in the report of the Inter-Agency Policy Committee on Rubber to the effect that efficiently produced natural rubber could be sold profitably in the New York market at prices ranging from 8 to 12 cents per pound, actual natural rubber prices held for a five year average of about 22 cents a pound until 1949. In 1949 natural rubber prices dropped as

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tion, "The U. S. Artificial Rubber Industry" (Cornell) June 1952. A microfilm copy is also available at the Library of Congress. The thesis was based in large part on the unpublished documents, gathered by the so-called Baruch Committee in 1941, and the Inter-Agency Policy Committee on Rubber in 1945-46, which documents are on file at the National Archives.

[4] Cf. *Report of the Inter-Agency Policy Committee on Rubber*, Washington, July 1946.

low as 14 cents and averaged 17.56 cents for the year. During 1950, however, the Korean crisis brought about an acceleration of strategic stockpiling which (with other factors) caused a quadrupling of natural rubber prices. By February 1951 the price of natural rubber stood at 73.61 cents per pound. Inflated prices were followed by inflated costs so that the recent deflation of rubber prices down to what appears to be a normal level, i.e., to the post-war average price of natural prior to 1950, is alleged to be causing real difficulties for the rubber producing companies and for the economies dependent to some degree on the export of natural rubber. An economic crisis in those territories could have political repercussions to which the United States State Department could not afford to remain indifferent.

On the American scene there have been great strides made in the synthetic rubber technology,[5] and at the same time there has been a growing sense of the long range vulnerability of the natural rubber industry. These two considerations have combined to brighten greatly the long range commercial prospects of the synthetic rubber industry, and to increase the attractiveness of that industry to private investment. This has resulted in a cumulatively greater pressure on the Government to offer its synthetic rubber plants for sale. On August 7 of last year, Public Law 205 was passed sanctioning the sale of the Government plants to private industry, and setting up a procedure for their disposal. Subsequently bids have been submitted and the final negotiations for their sale are now in process. It is expected that the plants will for the most part pass into the hands of the large petroleum producers and tire manufacturers who now operate them for the Government.[6]

Thus a struggle between the producers of natural and synthetic rubber appears to be in prospect; a struggle that may have serious strategic and economic repercussions. It is not, however, the purpose of this paper to foresee the final outcome or the general consequences of this conflict, but only to consider the possible impact of the transference of the American synthetic rubber plants from Government to private ownership.

The expectations that might possibly have motivated the pressure of the natural rubber producers for the transfer of the American synthetic rubber plants from Government to private ownership would appear to be the following: (1) that the transference of the Government plants into private hands would eliminate or would lower the level of protection extended by the American Government to insure the maintenance of some minimum of domestic consumption of synthetic rubber; and (2) that the transference might enable an international cartelization of all raw (synthetic and natural) rubber production; and (3) that the transference would lead to a higher selling-price for synthetic rubber and hence would relieve the competitive pressure on the price of natural rubber. Each of these possible expectations will be considered in turn.

[5] Cf. the author's "Research and Development in the Synthetic Rubber Industry," *The Quarterly Journal of Economics*, Feb. 1954.

[6] Since the time this article was accepted for publication, the synthetic rubber plants have been sold into private ownership. The form of the transference was as anticipated.

THE ELIMINATION OF PROTECTION

The synthetic rubber industry has been protected, under the law, to a limited extent against foreign competition.

The synthetic rubber plants were built and have been operated by private companies on Government account under the general supervision of a branch of the Reconstruction Finance Corporation. Two basic types of synthetic rubber are being produced; Butyl, used for inner-tubes, produced in plants built and run by the Standard Oil Company (N. J.); and GR-S (German Buna-S Rubber) which constitutes the large bulk of the output and which is used in the fabrication of tire treads and carcasses. GR-S is composed of the linked hydrocarbons, butadiene and styrene. The styrene plants were built by large chemical companies and, during 1946-47, these concerns purchased four of the five Government plants. The remaining plant is operated by the Dow Chemical Company. Major petroleum refining companies built the low-cost butadiene plants, and the large tire manufacturers built the copolymerization plants where butadiene and styrene are combined into finished GR-S. In general the companies that built the plants have continued to operate them for the Government.

In the Rubber Act of 1948,[7] Congress gave the President the right to establish a mandatory consumption of American synthetic rubber at any level which he considered to be necessary for the maintenance of national security, but required that the level maintained should not be less than 220,000 tons of Butyl and GR-S per annum. The Administration accepted this 220,000 minimum as the mandatory level. After experiencing severe rubber shortages during the Korean mobilization, in April 1952 the Administration raised the level of required consumption to 510,000 annual tons. Consumption was enforced by administrative orders which specified that various percentages of synthetic rubber should be used in the fabrication of particular categories of rubber products. With a given output of rubber products, the higher the level of synthetic rubber consumption, the more the demand for natural rubber is reduced. Where protection, whether exercised through specifications-control or tariffs or quotas or some other means, raises the consumption of synthetic rubber above the level that would have been consumed voluntarily, to that extent it reacts against the interests of the natural rubber producer.

Although foreign interests might suppose that the transfer of the American synthetic facilities into private hands will weaken the forces sustaining protection, and/or will lead to the lowering or to the elimination of the level of protection, it is more likely that precisely the opposite will be the case, with the sale of the plants leading to a strengthening of the forces supporting protection and to a raising rather than to a lowering of the protected level.

While the plants have been under Government ownership, the only significant

[7] Public Law 469. "To strengthen national security and the common defense by providing for the maintenance of an adequate domestic rubber-producing industry, and for other purposes" approved May 31, 1948. Prior authority for control of the industry was covered by the Second War Powers Act (which was especially extended by Public Law 24, 80th Congress).

pressure for protection has been that exerted by the security planner and the war strategist.[9] Except for a minor concern by certain petroleum producers to maintain a small additional outlet for their byproducts, no commercial interest has been identified with the demand for synthetic rubber protection. Rubber importers and the scrap rubber trade are both disadvantaged by the new industry. The important tire manufacturing industry and its customers are commercially interested in the continuing production of synthetic rubber only so long as the voluntary exceeds the mandatory level of consumption.

That strategic interests alone are a weak under-pinning for a policy of this kind is amply illustrated by the brief history of the synthetic rubber operation. Protection has, in fact, been largely nominal; except for a part of 1949, voluntary has exceeded the required level of consumption by considerable margins. However, stimulated by that single 1949 slump of natural rubber prices, the powerful tire producers turned on the Government's synthetic rubber operation. Individually and through their trade association, they urged Congress to abolish mandatory consumption and to plan the liquidation of the synthetic rubber industry, relying on the accumulation of stockpiles in rubber for any required margin of national safety. Scarcely a voice was raised in defence of what war-strategists had regarded three years earlier as an essential foundation of national security. The threat to the continued existence of the industry was shunted aside by an upsurge in 1950 of natural rubber prices to unprecedented heights, but not before the essential vulnerability of the "protection" extended to the Government-owned synthetic rubber operation had been clearly demonstrated.

The sale of the plants will radically alter the forces which under-pin a policy of protection. A coincidence will have been created between the strategic interest and a powerful commercial interest. For the first time, strong and articulate private interests, who have invested heavily in the purchase and operation of the plant, will have profits and solvency at stake in the level of synthetic rubber operations. The argument for a strategically-required level of synthetic rubber operations under Government protection, will, of course, be no stronger or weaker than before, but now there will be someone to make that argument, an interested advocate, a friend at court as there never was before. It is likely that the level of voluntary consumption will be such that the argument for Government protection will never have to be made. But the conclusion seems inevitable that the sale of the plants will increase the potential pressure for protection.

The possibility exists that trade in natural rubber will eventually be subject

[9] Officials of the Reconstruction Finance Corporation have been concerned to maintain a high level of output in the synthetic rubber plants under their control since this enabled the corporation to make a better financial showing. Under other circumstances this bureaucratic interest might have been of some importance. In the present instance the officials in charge of the synthetic rubber operations exerted no perceptible pressure to increase or to maintain the level of protection, possibly because the R. F. C. recruited these key officials directly from the companies who either sold raw materials to the synthetic rubber operation or who purchased the finished rubber from it. Hence the purely bureaucratic interests of the Government officials were subordinated to the commercial interests of the companies concerned.

to an international trade agreement, with quotas and buffer stocks serving to hold prices within an agreed-upon range.[9] Study groups on the subject have been held, and within the various international trade organizations a considerable pressure has been exerted in this direction. While more recent State Department thinking has seemed to run counter to such arrangements, a severe fall in the world prices of agricultural commodities will surely bring a strong renewal of pressure to negotiate such agreements. Should such be the case, an agreement on natural rubber is likely to be demanded as a *quid pro quo* for the protection of the commodities in which the United States is particularly interested. Any such agreement is bound to be the result of the counterbalancing of pressures and the compromise of interests-in-conflict. The existence of the new, financially powerful American industry, forged by the link of the invested dollar to the self-interest of other industrial giants, producing a product in direct competition with natural rubber, is bound to narrow the politically feasible range of concession that can be made (or the protection that can be offered) to the producers of natural rubber. Hence on the plane of international politics, the creation of a privately-held synthetic rubber industry cannot be considered as a development favorable to the interests of the natural rubber producer.

THE INTERNATIONAL CARTELIZATION OF NATURAL AND SYNTHETIC RUBBER

For long periods in its history, especially in the years immediately preceding World War II, the natural rubber industry was organized into a profitable, government-supported cartel. There have been indications that the producers of natural rubber may envisage a new arrangement embracing both synthetic and natural rubber and hence have considered the transference of the Government synthetic rubber plants into private hands as the necessary first step in the formation of a world rubber cartel including both the producers of natural and of synthetic rubber.

There appears no likelihood that such an arrangement could be made or would be allowed since (1) political conditions in the Far East offer small prospect for the effective long-range control of output in those areas and since (2) such arrangements would be contrary to the internal anti-trust policy of the United States, and would be in complete contradiction to the principles which have dominated American foreign policy in this sphere, i.e., the insistence on unrestricted foreign trading. But more than this, the possibility of restrictive arrangements will be even more difficult of achievement under the new circumstances than under the old. The maintenance of economic and political stability in the Far East must have a high priority in the diplomatic calculation of the American State Department, and so long as the plants were under Government ownership this consideration could have been made to have had a bearing on the determination of price and production policy for synthetic rubber. Not so, when the plants are owned by private parties. Thus the GR-S facilities will certainly be taken over in great part by firms of the tire manufacturing industry whose primary interest in them will be as a consumer rather than as a producer of

[9] I am indebted to my colleague Professor Max Gideonse for guidance on this point.

rubber for sale. It is to the disadvantage of these companies, as major consumers of raw rubber, that the production of rubber be curtailed and that prices be driven up. For these industrial consumers, a prime value of the synthetic rubber operation is that, in reducing the aggregate demand for natural it drives down the price of natural. There is indeed every reason to suppose that these new owners will not only never consent to participate in the restrictive control of raw rubber production, but will use their possession of GR-S facilities to defeat any attempt by Far Eastern producers to recreate the cartelized control even of natural rubber production alone.

AN INCREASE IN THE SELLING-PRICE OF SYNTHETIC RUBBER

It has been the policy of the Reconstruction Finance Corporation, in its control over the operation of the Government synthetic rubber plants, to fix a price for synthetic rubber sufficient to cover all costs including a substantial allowance for plant amortization. Conventional business practice (average-cost pricing) in the private sector would have included in price an additional margin of profit. Thus, given the same cost structure, the "average-cost" price at which rubber would have been offered by a private company would be greater than the Government price. It is indeed to be expected that the sale of the plants will lead to an immediate increase in the selling price of Butyl and GR-S. It might be supposed that foreign producers were anxious for the transfer of the synthetic plants into private hands because they anticipated such a price rise, presuming that higher synthetic rubber prices would lead to a decrease in the consumption of synthetic rubber and to a corresponding increase in the demand for natural rubber.

It would seem, however, that over a period of years the competitive position of the natural rubber producer *vis a vis* the synthetic rubber industry will suffer rather than be benefited by the private acquisition of the Government plants. This for several reasons.

The offering price is, first, no measure of the aggressiveness of competition. Unlike the undeviating rigidity of Government price policy, private firms will cut prices in response to a declining level of natural rubber prices or in a fight to maintain or to expand their levels of output. And the private firm, with the ability to offer a stable price and (during periods of natural rubber shortage) a relatively low price, will surely seek to negotiate long term contracts with purchasers and thus permanently preempt a larger share of the rubber market. The present marketing organization of the natural rubber industry does not permit contractual arrangements of this sort in the sale of natural rubber.

Second, the price at which synthetic rubber is offered is not dependent on mark-up practices alone. Price is also a function of the cost structure, which in turn is determined by the level of operating efficiency and by the pace of technological development. If it may be assumed that private capitalism and the free market serves the interests of the consumer as well as those of the shareholder, the price at which synthetic rubber is offered for sale will, in a reasonably short time, be reduced below what it might have been if the industry had remained in Government hands—through the lowering of costs. Especially should this be

true in the case of synthetic rubber where the historic organization of the industry in no way approached a model of efficient nationalization. Plants in this industry have been operated on a simple cost-plus-a-fixed-fee basis with no material incentive to efficiency.

Technological advance, manifesting itself in lowered costs and prices, and especially in an improved product, is likely to be the key to the competitive struggle. And if the remarkable results hitherto achieved by the private research peripheral to the Government-sponsored program is any criterion, we may expect the profit incentive vastly to accelerate the progress of the synthetic rubber technology.

And third, the price at which synthetic rubber is offered for sale on the open market will, to a great extent, be wholly irrelevant to the choice by the commercial consumer as between synthetic and natural rubber. Inasmuch as the feedstock or GR-S capacity is owned by the manufacturers of tires or of other types of rubber products, the level of synthetic rubber consumption by those integrated companies will not be determined by the price at which they offer their rubber to the outside buyer, but rather by the incremental (marginal) costs attributable to the production of synthetic rubber. The likely significance of this factor in the future determination of the relative rates of synthetic and natural rubber consumption, given the particular technological circumstances of the synthetic rubber industry, may be illustrated by reference to cost studies incorporated into the so-called "Steelman Report" purporting to analyse the cost structure of a "typical" Gulf Coast "operation of a butadiene and an adjacent copolymer plant with effective capacities of 60,000 short tons and 75,000 long tons respectively."[10]

Without attempting to evaluate the reliability of its conclusions, it is clear at least that the Steelman Report embodies a considerable research effort made with the advantage of full and direct access to cost and output data. No doubt, subsequent technological developments have somewhat altered the cost structure of the "typical" plant. In this paper, however, the concern is not with the validity of the precise cost-output relationships developed by the Steelman Report, but only (for purposes of illustration) with the general shape of the production function. So long as average costs decline significantly as the level of output is increased, the argument made here remains valid.

In the "typical" operation described in the report, an increase in GR-S output from an annual production rate of 50,000 tons to 75,000 tons would cause average costs to drop from 18.04 to 15.32 cents per pound. Consider the effect on aggregate consumption, given this declining cost function, of a transfer of plant ownership from the Government to a private firm engaged primarily in the production of rubber products, e.g., a tire manufacturer.

Merely for sake of illustration it may be assumed that the market price of natural rubber is 17 cents a pound, and that the Government prices the synthetic rubber it offers for sale at average costs. If a normal out (per plant) is determined to be 50,000 tons, then the average-cost price of synthetic rubber

[10] *Synthetic Rubber Recommendations of the President*, Jan. 1950, pp. 43–48.

will be set at 18.04 cents per pound. At this price, consumers will limit the consumption of synthetic rubber to those uses where it is preferred over natural even at a 1.04 cent per pound premium in favor of natural. If normal output is set at 75,000 tons then (average-cost) price will be reduced to 15.32 cents per pound. At that price, synthetic would be substituted for natural rubber with natural rubber being consumed only in those uses where natural is preferred to synthetic even at a 1.68 per pound price differential in favor of synthetic. The increase in the output of synthetic from 50,000 to 75,000 tons could be maintained only if a reduction of 2.72 cents per pound in the price of synthetic was sufficient to induce a 25,000 ton increase in the consumption of synthetic rubber.

Consider the radically different cost-consumption effect in the likely event that ownership of the synthetic rubber plant is shifted from the Government to a private company which fabricates rubber products and which is itself a major consumer of synthetic and natural rubber, e.g., one of the large tire manufacturers. If it is assumed that this company were producing and disposing of 50,000 tons of synthetic rubber in its own plant, and the question arose as to whether to produce the additional 25,000 tons *for its own consumption* as against the alternative of buying and consuming that amount of natural rubber, then the rational decision of management would not be based as before on the comparative market prices of the two materials, or on the market price of natural as against its own average costs of producing the synthetic. The profit-maximizing decision of management would compare the costs of purchasing the additional natural with the incremental costs of producing the additional synthetic, i.e., with the costs specifically attributable to raising the output of synthetic rubber from a 50,000 ton to a 75,000 ton level. From the data of the Steelman Report, it would appear that the cost specifically attributable to this additional output of synthetic rubber would be approximately 9.9 cents per pound.[11] Hence in this example the cost differential favoring the internal consumption of the additional synthetic rubber would be 7.1 cents per pound rather than 1.68 cents per pound as before.

Simply put, as a consequence of the sale of the synthetic rubber plants, it is likely that the vertical integration between synthetic rubber production and rubber product fabrication will be characteristic of the new industry. A form of industrial organization where the major consumers of synthetic rubber own the synthetic rubber plants, bear the overhead costs of operating those plants and are in a position to avail themselves of the economies of declining marginal costs, is bound to favor the increased consumption of synthetic rubber (*vis a vis* natural) as compared to the former system of purchasing from the Government the synthetic rubber priced at average costs.

[11] To simplify, it is assumed that the 25,000 ton increase is indivisible with management faced with the alternative of either producing 50,000 tons or 75,000 tons of synthetic rubber. Where average costs are 18.04 cents per pound, costs would be $404,096 per long ton and total costs for 50,000 tons would be $20,204,800. Similarly, total costs for producing 75,000 tons (average costs at 15.32 cents per pound) would be $25,737,600. Thus the cost of producing the incremental 25,000 tons (56 million pounds) would be $5,532,800 in total or 9.9 cents per pound.

SUMMARY AND CONCLUSIONS

The sale of the synthetic rubber plants to private enterprise will remove a difficult item from the diplomatic agenda of the American State Department, but only temporarily. The conflict of interests has not been eliminated or mitigated; it has merely been shifted to another area. The prospect of a bareknuckle struggle for survival remains, and the possible consequences of that struggle are so considerable that neither the foreign policy of the United States nor of its allies could for long ignore it. It is important to protect the prosperity and to encourage the progressive technological development of the strategically vital American synthetic rubber industry. On the other hand the prosperity of the natural rubber industry is a prop to European solvency, and an economic catastrophe in the rubber producing areas could hurtle the troubled lands of Indonesia and Malaya into revolution and communism.

The foreign producers of natural rubber and the diplomats who have represented their interests have long pressed for the transference of the American synthetic rubber plants from Government to private ownership. This transference is now about to take place, but it is not likely that the natural rubber producer will benefit by it. It is true that the synthetic rubber production and price policies will no longer be dictated by the pressures of politics but will follow a more familiar entrepreneurial logic. Hence the producer of natural rubber will know better where he stands, and it would appear that he will soon know that he stands in a worsened rather than in an improved position. He will be faced, in the new privately-owned American synthetic rubber industry, with an aggressive competitor capable of great technological competence and market acumen and supported by the financial resources of giant petroleum refiners and tire manufacturers. The potential pressure for the protection of the domestic synthetic rubber market against the competition of natural rubber imports will have been strengthened by the private profits and private investment now at stake. For the same reason a diplomatic deal in the form of a trade agreement favorable to the interests of natural rubber will now become immensely more difficult to arrange. And finally the integration of synthetic rubber production and rubber product fabrication will create a strong new bias in favor of the consumption of synthetic as against natural rubber.

A PERIOD ANALYSIS OF FISCAL POLICIES*

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During approximately the last dozen years, several writers have described the various sorts of fiscal policy—varying the levels of government expenditure and of tax collections—which can affect changes in national income. Most of these discussions have dealt with expansionist "routes to full employment."[1] And most have been characterized both by ingenuity and by some expositional cumbersomeness, with some interesting relationships being thereby obscured. The purpose of this paper is to simplify the presentation of the essential ideas by means of a period analysis based upon elementary but systematic algebraic derivations.[2]

I

In the tables that follow, C = consumption expenditure; S = savings; G = government expenditure on current output (transfer payments are assumed zero); I = private investment expenditure; Y = national income; T = tax payments (collections); and $X = Y - T$ = disposable income. We shall employ a Robertsonian model, in which Y in any period is the sum of C, G, and I in that period; and C in any period is a function of X in the preceding period. It is convenient to assume that average propensity to consume equals marginal propensity to consume (represented by c). In all our "routes," we shall start from an initial position of equilibrium with the government budget balanced at a level of spending and taxing of 100.

	C	S	G	I	Y	T	X
Period 1.....	720	180	100	180	1000	100	900
Period 2.....	720	180	100	180	1000	100	900

* The authors wish to acknowledge the helpful comments of C. L. Allen, K. Brunner, and A. H. Meltzer.

[1] One of the latest, and probably the most convenient geometric explanation, is J. G. Gurley, "Fiscal Policies for Full Employment: A Diagrammatic Analysis," *Journal of Political Economy*, LX (1952), pp. 525-33; also *idem*, "Deficits, Surpluses, and National Income," *Southern Economic Journal*, XXI (1954), pp. 15-24.

[2] Cf. T. C. Shelling, *National Income Behavior* (New York: McGraw-Hill Book Co., 1951), esp. pp. 65-72. For a brief statement of the nature and rationale of period analysis —a most useful device for visualizing related changes, autonomous and induced, in several variables—see W. J. Baumol, *Economic Dynamics* (New York: Macmillan Co., 1951), pp. 123-26.

It is assumed throughout that I remains constant at 180 and that marginal propensity to consume remains constant at a value of .8. The original tax rate (r) is 100/100 = .1. Our objective in each of the routes will be to raise Y from a level of 1000 to 1200.

The economic system may be characterized by a set of four equations:

(1) $Y = C + I + G$, which is the definition of income.
(2) $C = cX$, which is the behavior hypothesis of the household sector.
(3) $X = Y - T$, which is the definition of disposable income.
(4) $T = rY$, which is the tax function (behavior hypothesis of the fiscal authorities).

These equations, in the four endogenous variables Y, C, X, and T, with the parameters I and c, and the exogenous variables G and r, define a complete system. So we may solve for Y in terms of the exogenous variables and the parameters. First substitute for T in equation (3) in terms of equation (4):

$$X = Y - rY = Y(1 - r) \tag{5}$$

Substitute for X in equation (2) in terms of equation (5):

$$C = cY(1 - r) \tag{6}$$

Use the result of equation (6) in equation (1):

$$Y = cY(1 - r) + I + G \tag{7}$$

$$Y = \frac{I + G}{1 - c + cr} \tag{8}$$

II

Route I to full employment involves an increase in government spending with no change in the tax rate. Letting ΔG represent the change in the level of government expenditures, we have the new equilibrium value of income (Y'):

$$Y' = \frac{I + G + \Delta G}{1 - c + cr} \tag{9}$$

The change in income as a result of the change in government spending, ΔY_g, is, of course,

$$\Delta Y_g = Y' - Y \tag{10}$$

and upon substitution for Y' and Y we obtain:

$$\Delta Y_g = \frac{\Delta G}{1 - c + cr} \tag{11}$$

It is convenient to let $m = 1 - c + cr$. From equation (11) it is apparent that the amount by which government expenditures must be changed in order to obtain a given desired change in income, *ceteris paribus*, is:

$$\Delta G = m\Delta Y_g \tag{12}$$

TABLE I

($\Delta G = 56$; $\Delta r = 0$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	156	180	1056	105.600	950.400
760.320	190.080	156	180	1096.320	109.632	986.688
789.350	197.338	156	180	1125.350	112.535	1012.815
810.252	202.563	156	180	1146.252	114.625	1031.627
864	216	156	180	1200	120	1080

Recalling our objective to raise Y by 200 and inserting other given values in equation (12), $\Delta G = (1 - .8 + .08)200 = 56$. The nature of the expansion process is indicated in Table I, containing the first few periods and the final equilibrium values.

These results, then, are determined by a multiplicand of $\Delta G = 56$ and a government-spending multiplier of $(1/[1 - c + cr]) = 3.571$. And, as in all the routes, total injections, G and I, equal total leakages, S and T, in a given period when equilibrium obtains.

III

A second method of raising income consists of a reduction in tax collections with government spending unchanged. Denoting the change in the tax rate by Δr, the new equilibrium level of income will be

$$Y' = \frac{I + G}{1 - c + c(r + \Delta r)} = \frac{I + G}{m + c\Delta r} \tag{13}$$

The change in the equilibrium level of income induced by the change in the tax rate is

$$\Delta Y_r = Y' - Y \tag{14}$$

Replacing the right-hand terms by expressions obtained in equations (13) and (8), respectively, we derive

$$\Delta Y_r = \frac{-c(I - G)\Delta r}{m(m + c\Delta r)} = \frac{-cY\Delta r}{m + c\Delta r} \tag{15}$$

With the desired change in income given, we may solve for the necessary tax rate change.

$$\Delta r = \frac{-m\Delta Y_r}{c(Y + \Delta Y_r)} \tag{16}$$

In our example, $\Delta r = (-.28(200)/.8(1200)) = -.05833$, and the new tax rate is thus $r' = r + \Delta r = .1 - .05833 = .04167$.

TABLE II

($\Delta G = 0$; $\Delta r = -.05833$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	100	180	1000	41.667	958.333
766.666	191.667	100	180	1046.666	43.615	1003.051
802.441	200.610	100	180	1082.441	45.105	1037.336
829.869	207.467	100	180	1109.869	46.248	1063.621
920	230	100	180	1200	50	1150

Conceptually, there are two basic alternative patterns of expansion in this route: (a) reduce the tax *rate* to a lower constant level, allowing tax collections to increase as income expands, or (b) reduce tax *collections* to a lower constant level by lowering the tax rate and then adjusting the tax rate at each new income level. Alternative (a), illustrated in Table II, is administratively more feasible, and it raises income at a somewhat faster rate.

Economically, the initial change in consumption expenditure (766.666 − 720 = 46.666), resulting from the change in the tax rate via the change in disposable income and the consumption function, plays the same role as the change in government spending played in the first route. However, this initial ΔC is only a "pseudo" multiplicand. The true multiplicand must be an exogenous variable, and here consumption expenditure is determined by relations within the model. In this case, the multiplicand is the (autonomous) change in the tax rate, i.e., Δr.

Comparing routes I and II, the initial tax reduction under the latter (58.333) is larger than the increase in government spending (56) under the former; and in final equilibrium, the government deficit under Route II (50) is larger than under Route I (36). On the other hand, the final level of disposable income is larger under the second route (1150 compared to 1080), and the level of government expenditure is smaller (100 compared to 156).

IV

The fiscal authorities may, of course, use their weapons of spending and taxing simultaneously. We can combine Routes I and II into a third policy: increase government expenditure and decrease the tax rate. The new equilibrium income level is

$$Y' = \frac{I + G + \Delta G}{m + c\Delta r} \tag{17}$$

The change in income is $\Delta Y = Y' - Y$. Upon substituting for Y' and Y in terms of equations (17) and (8), we obtain

$$\Delta Y = \frac{\Delta G - cY\Delta r}{m + c\Delta r} \tag{18}$$

TABLE III

($\Delta G = 50$; $\Delta r = -.00625$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	150	180	1050	98.438	951.562
761.250	190.312	150	180	1091.250	102.305	988.945
791.156	197.789	150	180	1121.156	105.108	1016.048
812.838	203.210	150	180	1142.838	107.141	1035.697
870	217.500	150	180	1200	112.500	1087.500

Since the desired change in income is assumed given, the only variables to be determined are ΔG and Δr. Solving for ΔG as a function of Δr, we derive

$$\Delta G = m\Delta Y + c(Y + \Delta Y)\Delta r \tag{19}$$

It follows that if one of the exogenous variables, ΔG or Δr, is presumed decided upon, the other can be determined. If, for example, the fiscal authorities agree upon a $\Delta r = -.00625$, it is necessary that $\Delta G = 50$ in order to increase income by 200. In Table III, the increase in expenditure precedes the cut in the tax rate; the pattern of expansion would be somewhat different if the sequence of changes were reversed.

It is apparent from equation (19) that there is an infinite number of combinations of values for ΔG and Δr which will yield an increase in income of 200. But the limits to how much spending can be *increased* and the tax rate be *reduced* simultaneously in order to raise income a given amount have been indicated by Routes I and II. If the new tax rate is lower (reduced more) than that of Route II, government expenditure must be *lowered* (i.e., $\Delta G < 0$); if expenditure is greater than in Route I, the tax rate must be *raised*.[3]

By way of illustration, we may note a fourth route, in which both the tax rate and government expenditure are reduced. If it is desired to lower spending to a level of 85 and still to raise income to 1200, then $\Delta G = -15$, $\Delta Y = 200$, and therefore $\Delta r = -.07396$. If the cut in spending precedes the reduction in the tax rate, we have the conditions of Table IV.

However, we need not restrict ourselves to only one change in income. We can treat ΔY as a parameter of the function, and by varying this parameter we define a new function. In this manner, we can sweep out a family of straight-line iso-income curves (see figure 1).[4] Each curve represents some given change in the level of income. Moving upward along the Y-axis, successive curves

[3] In Route II, $\Delta Y_r = (-cY\Delta r/[m + c\Delta r])$ (equation 15). This is equal to Route III's $\Delta Y = (\Delta G - cY\Delta r/[m + c\Delta r])$ (equation 18) when $\Delta G = 0$. Thus, if (arithmetically) $\Delta r_{III} > \Delta r_{II}$, $\Delta G < 0$. In Route I, $\Delta Y_g = \Delta G/m$ (equation 11). This is equal to equation (18) when $\Delta r = 0$. Thus, if $\Delta G_{III} > \Delta G_I$, $\Delta r > 0$. In short, equations (11) and (15) are special cases of equation (18).

[4] With $m = .28$, $Y = 1000$, $c = .8$, and $\Delta Y = 200$, our function in equation (19) becomes $\Delta G = 56 + 960\Delta r$. The curvilinear lines are discussed below.

TABLE IV

($\Delta G = -15$; $\Delta r = -.07396$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	85	180	985	25.649	959.351
767.481	191.870	85	180	1032.481	26.886	1005.595
804.476	201.119	85	180	1069.476	27.849	1041.627
833.302	208.325	85	180	1098.302	28.600	1069.702
935	233.750	85	180	1200	31.250	1168.750

represent greater increases in income. For any given increase in income, ΔG is an increasing linear function of Δr; furthermore, as the desired ΔY is increased, the slopes as well as the positions of the iso-income lines increase.

V

Before considering the balanced-budget route, we may note the nature of the deficit function and its relation to disposable income.

As indicated in equation (4), tax collections depend upon the level of income and the tax rate. And a new level of tax collections will be given by

$$T' = (r + \Delta r)(Y + \Delta Y) \tag{20}$$

The change in tax collections is,

$$\Delta T = T' - T \tag{21}$$

And by substituting results obtained in equations (20) and (4), we have

$$\Delta T = r\Delta Y + Y\Delta r + \Delta r\Delta Y \tag{22}$$

Assuming that the budget is balanced in our original equilibrium, the deficit (D) incurred in attaining a desired increase in income will depend upon the relative changes in government expenditures and tax receipts.[8]

$$D = \Delta G - \Delta T \tag{23}$$

We may substitute for ΔG and ΔT the appropriate expressions in equations (19) and (22):

$$\begin{aligned} D &= (1 - c + cr)\Delta Y + c(Y + \Delta Y)\Delta r - r\Delta Y - Y\Delta r - \Delta r\Delta Y \\ D &= (1 - c)(1 - r)\Delta Y - (1 - c)(Y + \Delta Y)\Delta r \end{aligned} \tag{24}$$

Thus, the size of the deficit is a linear function of the change in the tax rate, given the desired change in income. This result is not surprising, for both the necessary change in government spending and the change in tax collections depend upon the tax rate.

[8] Since the budget is balanced initially, i.e., the deficit (surplus) is zero, the value of D in the new equilibrium is the amount by which the deficit (surplus) has changed through the government policy. But our equations are general solutions, covering cases where the budget is not originally in balance: D always refers to the *change* in the budget.

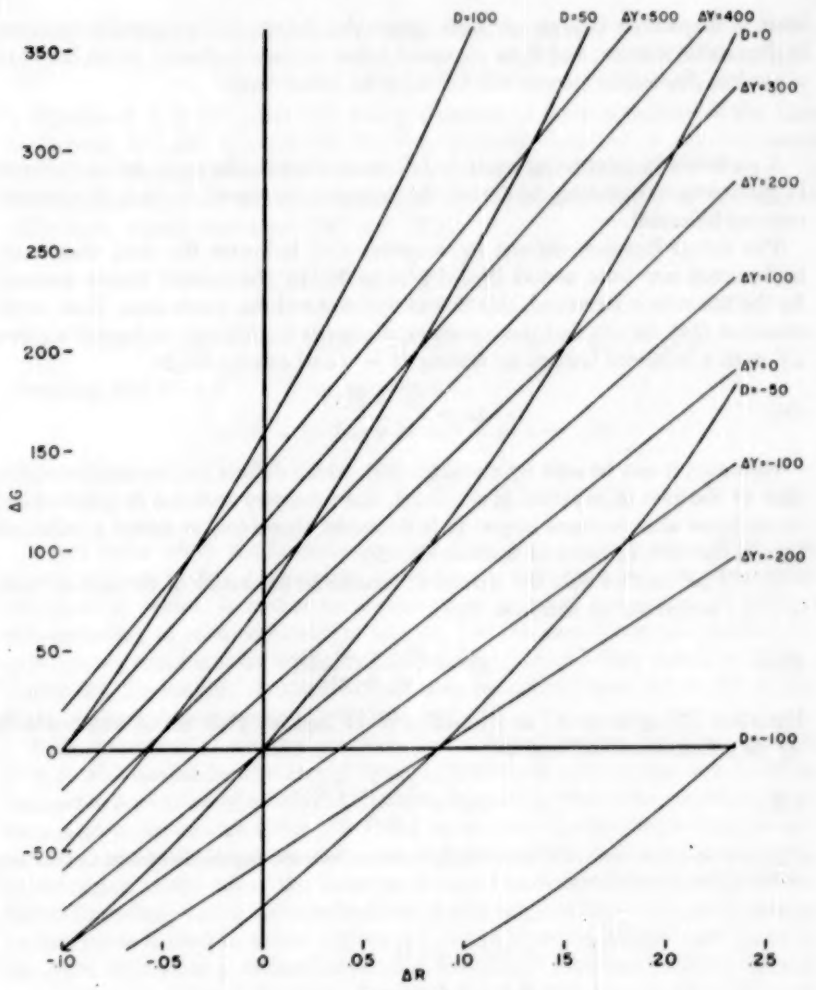

FIGURE 1

The original level of disposable income is given by equation (3). It follows, employing equation (22), that

$$\Delta X = \Delta Y - \Delta T = \Delta Y - r\Delta Y - Y\Delta r - \Delta r\Delta Y \tag{25}$$
$$\Delta X = (1 - r)\Delta Y - (Y + \Delta Y)\Delta r$$

The change in disposable income is a linear function very similar to the relation of D to Δr. Indeed, if the right side of equation (25) is multiplied by $(1 - c)$, we obtain the deficit function, equation (24).

In short, there is a positive relation between the size of the deficit and the

TABLE IV

($\Delta G = -15$; $\Delta r = -.07396$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	85	180	985	25.649	959.351
767.481	191.870	85	180	1032.481	26.886	1005.595
804.476	201.119	85	180	1069.476	27.849	1041.627
833.302	208.325	85	180	1098.302	28.600	1069.702
935	233.750	85	180	1200	31.250	1168.750

represent greater increases in income. For any given increase in income, ΔG is an increasing linear function of Δr; furthermore, as the desired ΔY is increased, the slopes as well as the positions of the iso-income lines increase.

V

Before considering the balanced-budget route, we may note the nature of the deficit function and its relation to disposable income.

As indicated in equation (4), tax collections depend upon the level of income and the tax rate. And a new level of tax collections will be given by

$$T' = (r + \Delta r)(Y + \Delta Y) \tag{20}$$

The change in tax collections is,

$$\Delta T = T' - T \tag{21}$$

And by substituting results obtained in equations (20) and (4), we have

$$\Delta T = r\Delta Y + Y\Delta r + \Delta r\Delta Y \tag{22}$$

Assuming that the budget is balanced in our original equilibrium, the deficit (D) incurred in attaining a desired increase in income will depend upon the relative changes in government expenditures and tax receipts.[4]

$$D = \Delta G - \Delta T \tag{23}$$

We may substitute for ΔG and ΔT the appropriate expressions in equations (19) and (22):

$$\begin{aligned} D &= (1 - c + cr)\Delta Y + c(Y + \Delta Y)\Delta r - r\Delta Y - Y\Delta r - \Delta r\Delta Y \\ D &= (1 - c)(1 - r)\Delta Y - (1 - c)(Y + \Delta Y)\Delta r \end{aligned} \tag{24}$$

Thus, the size of the deficit is a linear function of the change in the tax rate, given the desired change in income. This result is not surprising, for both the necessary change in government spending and the change in tax collections depend upon the tax rate.

[4] Since the budget is balanced initially, i.e., the deficit (surplus) is zero, the value of D in the new equilibrium is the amount by which the deficit (surplus) has changed through the government policy. But our equations are general solutions, covering cases where the budget is not originally in balance: D always refers to the *change* in the budget.

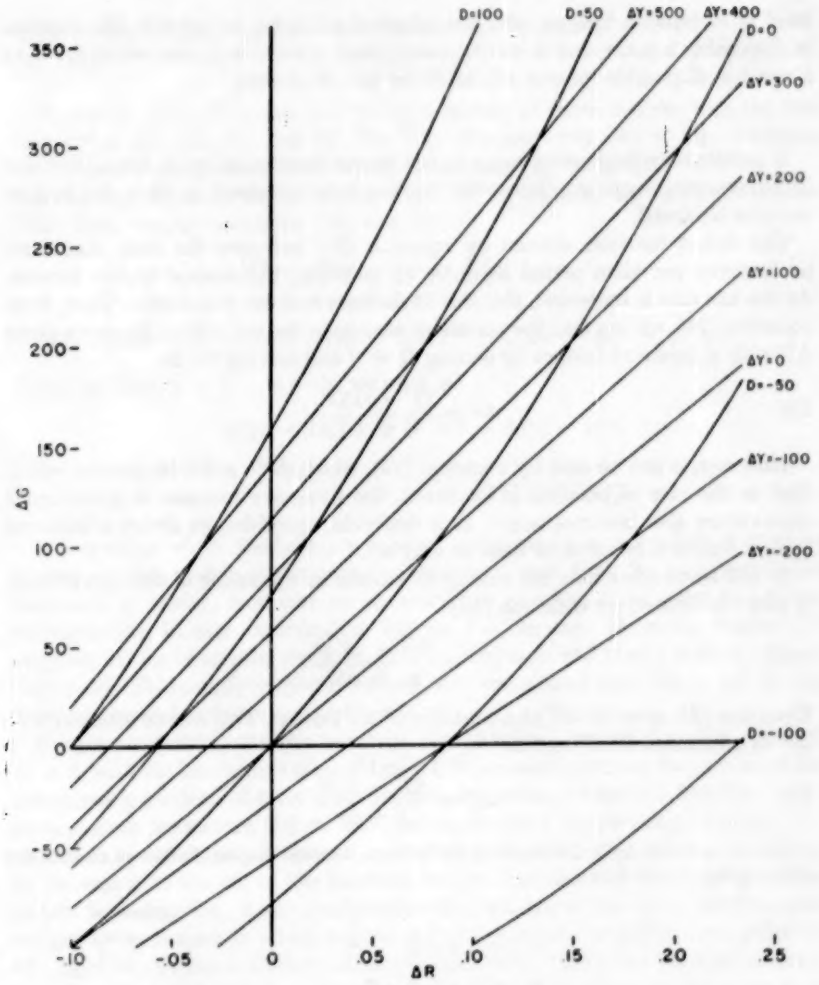

FIGURE 1

The original level of disposable income is given by equation (3). It follows, employing equation (22), that

$$\Delta X = \Delta Y - \Delta T = \Delta Y - r\Delta Y - Y\Delta r - \Delta r\Delta Y \tag{25}$$
$$\Delta X = (1 - r)\Delta Y - (Y + \Delta Y)\Delta r$$

The change in disposable income is a linear function very similar to the relation of D to Δr. Indeed, if the right side of equation (25) is multiplied by $(1 - c)$, we obtain the deficit function, equation (24).

In short, there is a positive relation between the size of the deficit and the

level of disposable income, *viz.*, the larger the deficit, the greater the increase in disposable income; and if, as discussed below, a route is chosen which involves a surplus, disposable income will fall from its initial level.[6]

VI

A particularly interesting route to full employment calls again for an increase in government spending, but with the tax rate increased so that the budget remains balanced.

The deficit function defined by equation (24) indicates the debt that must be incurred per time period in order to maintain the desired higher income. As the tax rate is increased, this deficit declines and can reach zero. Thus, from equation (24), we can find the necessary change in the tax rate to finance a given ΔY with a balanced budget by setting $D = 0$ and solving for Δr.

$$\Delta r = \frac{(1 - r)\Delta Y}{Y + \Delta Y} \tag{26}$$

However, it can be seen by equation (19), which defines the iso-income curve, that as the rate of taxation is increased, the necessary increase in government expenditure also becomes larger. It is desirable, therefore, to derive a balanced budget function in terms of both Δr and ΔG.

It will be recalled that the change in income as the result of changes in both G and r is defined by equation (18):

$$\Delta Y = \frac{\Delta G - cY\Delta r}{m + c\Delta r} \tag{18}$$

Equation (22) gives us ΔT as a function of ΔY and Δr. This can be restated with ΔY as a function of ΔT and Δr:

$$\Delta Y = \frac{\Delta T - Y\Delta r}{r + \Delta r} \tag{27}$$

[6] An alternative method of showing the relation between disposable income and the size of the deficit is as follows:

$$X = Y - T$$
$$Y = C + I + G$$
$$X = C + I + G - T$$
$$D = G - T$$
$$X = C + I + D$$
$$C = cX$$
$$X = \frac{I + D}{1 - c}$$
$$\Delta X = \frac{\Delta D}{1 - c} \quad \text{or} \quad \Delta D = (1 - c)\Delta X$$

Therefore, as the size of the deficit is increased, disposable income also increases.

Finally, the condition of a balanced budget can be stated:[7]

$$\Delta G = \Delta T \tag{28}$$

Equations (18), (27), and (28) define a system of three equations in the four unknowns, ΔY, ΔG, Δr, and ΔT. We may eliminate any two of the unknowns and obtain a relationship between the remaining two variables.

First, substitute for ΔT in equation (27) by the equality set forth in equation (28); then, equate equations (18) and (27).

$$\frac{\Delta G - cY\Delta r}{m + c\Delta r} = \frac{\Delta G - Y\Delta r}{r + \Delta r}$$

$$\Delta G(r + \Delta r - m - c\Delta r) = \Delta r(cYr + cY\Delta r - mY - cY\Delta r)$$

Recalling that $m = 1 - c + cr$, we obtain:

$$\Delta G(c - 1)(1 - r - \Delta r) = \Delta r(c - 1)Y$$

$$\Delta G = \frac{Y\Delta r}{1 - (r + \Delta r)} \tag{29}$$

Every value which the function assumes represents a combination of changes in the tax rate and in government expenditures such that the budget remains balanced. However, it makes no statement as to what the change in income corresponding to each combination will be. For the case where the desired ΔY is given, we could employ equation (26) to obtain Δr and then equation (29) to derive ΔG. To simplify matters, having once recognized that $\Delta G = \Delta Y$ in the balanced budget case, we need calculate only Δr.[8]

Diagrammatically, we can combine the balanced budget function, labeled $D = 0$, with the iso-income map of figure 1. Since each point on the new function represents a position of a balanced budget, by noting where this function intersects a given iso-income line we can read on the axes the necessary changes in r and in G to attain this increased level of income. Note that every point lying in the region to the left of the balanced budget function represents a method of deficit financing—i.e., if any combination of ΔG and Δr to the left of the balanced budget curve is used to attain a given ΔY, we will incur a deficit; each point to the right represents a method of surplus financing.[9] This can be seen directly if we include in figure 2 the deficit function: the deficit is zero at the same level of Δr where the balanced budget schedule intersects the iso-income curve.

In terms of period analysis, two variations in the expansion pattern are

[7] Equation (28) is obviously a special case of equation (23) where $D = 0$.

[8] That $\Delta G = \Delta Y$ in this case is a familiar proposition. See P. A. Samuelson, "The Simple Mathematics of Income Determination," pp. 140–43, and the references cited there, in *Income, Employment and Public Policy: Essays in Honor of Alvin H. Hansen* (New York: W. W. Norton and Co., 1948). Furthermore, it will be noted that since the values of Y' (the desired income) and of T' (the tax collections necessary to balance known government expenditures) are known, we may write simply: $r' = T'/Y'$.

[9] A positive value for D, implying that government expenditures exceed tax collections, represents a budget deficit; a negative D is a surplus.

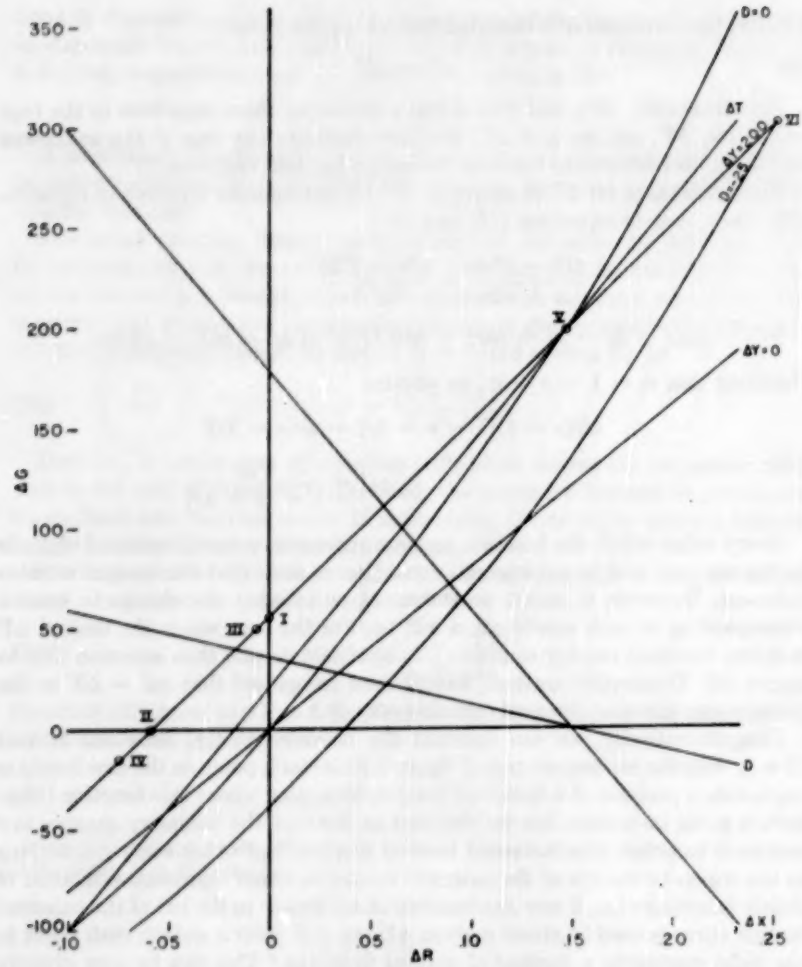

FIGURE 2

apparent: (a) the increase in spending may precede the increase in taxation, so that national income immediately rises to its new equilibrium level and disposable income does not fluctuate; (b) as illustrated below, the tax increase may anticipate the rise in government expenditure, in which case disposable income will initially fall and then rise back to the original level, and national income will increase over time to the new equilibrium level. With $\Delta G = 200$ and $\Delta r = .15$, we have the conditions of Table V.

Disposable income either remains constant or eventually regains the original value. If we assume that an increase in employment is associated with the

TABLE V

($\Delta G = 200$; $\Delta r = .15$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	100	180	1000	250	750
600	150	300	180	1080	270	810
648	162	300	180	1128	282	846
676.8	169.2	300	180	1156.8	289.2	867.6
720	180	300	180	1200	300	900

increase in national income, average disposable income per *employed* worker has been reduced. We are faced, therefore, with the following welfare problem: on the one hand, the originally employed workers (or an equal number of workers) have, on the average, lower disposable income; on the other, previously unemployed workers have a higher income (rising from a level of zero), and there is a greater national income to be consumed communally.[10]

VII

It is important to note that the balanced budget route is only a special case of innumerable "constant budget" routes, i.e., budgets of different quantitative *levels* but of constant absolute deficits or surpluses. Thus we may alter government spending and taxing so as to achieve a given desired increase in income with a given desired budget deficit or surplus.

First, we shall deduce a constant-budget function analogous to the balanced-budget function, equation (29). From the preceding sections, we have:

$$\Delta Y = \frac{\Delta G - cY\Delta r}{m + c\Delta r} \tag{18}$$

$$\Delta Y = \frac{\Delta T - Y\Delta r}{r + \Delta r} \tag{27}$$

$$D = \Delta G - \Delta T \tag{23}$$

[10] In principle it appears unambiguous that total welfare is increased, if income of some sort is the sole criterion of welfare. With compensatory payments, the entire (unchanged) disposable income might continue to be distributed among the original workers, so we assume that their welfare position is not worsened; the new workers thus receive no disposable income, but they gain from the increased communal income. With the other routes, total disposable income has been increased. If it increases proportionately less than employment, the original workers can be fully compensated for the fall in average disposable income and still leave some disposable income for the new workers, in addition to the communal income. And, of course, if disposable income increases more than employment, average disposable income is increased, and welfare can increase without the need for discriminatory compensation. But in all cases except the last, we cannot avoid the concept of compensatory payments, for the increased communal income stemming from greater government expenditure cannot be considered a dividend commensurate with disposable income; i.e., private income and communal income are not additive, in welfare calculation, for an individual.

And it follows that

$$\Delta T = \Delta G - D \tag{30}$$

Upon substituting for ΔT in equation (27),

$$\Delta Y = \frac{\Delta G - D - Y\Delta r}{r + \Delta r} \tag{31}$$

We have equations (18) and (31) in three variables, ΔY, ΔG, and Δr. Equating the equations eliminates ΔY:

$$\frac{\Delta G - D - Y\Delta r}{r + \Delta r} = \frac{\Delta G - cY\Delta r}{m + c\Delta r}$$

We may now solve for ΔG:

$$\Delta Gm + \Delta Gc\Delta r - Dm - Dc\Delta r - Y\Delta rm - Y\Delta rc\Delta r = \Delta Gr + \Delta G\Delta r - cY\Delta rr - cY\Delta r^2$$

$$\Delta G(m + c\Delta r - r - \Delta r) = -cY\Delta r(r + \Delta r) + (D + Y\Delta r)(m + c\Delta r) \tag{32}$$

$$\Delta G(1 - c)[1 - (r + \Delta r)] = Y\Delta r(1 - c) + D(m + c\Delta r)$$

$$\Delta G = \frac{Y\Delta r}{1 - (r + \Delta r)} + \frac{D(m + c\Delta r)}{(1 - c)[1 - (r + \Delta r)]}$$

A balanced budget is, of course, a budget with a deficit (surplus) of zero. In this case, the second term in the right side of equation (32) becomes zero, and we then have the balanced budget function.

Holding D at a constant value (it will be recalled that a positive value for D denotes a deficit, a negative value a surplus), we can project a constant deficit (surplus) schedule, several of which, in addition to the balanced budget curve, are shown in figure 1. Where such a constant-budget schedule intersects an iso-income line, we find that combination of changes in government expenditure and in the tax rate which (a) will attain the indicated income change (b) with the desired deficit or surplus.

Suppose that we wish to increase the equilibrium level of income from 1000 to 1200 by means of a budget characterized by a surplus of 25 at the new income level. What are the necessary values of ΔG and of Δr? Diagrammatically, in figure 2 we can read the answers indicated by the intersection of the $D = -25$ and $\Delta Y = 200$ curves. Algebraically, we may employ equation (24) to isolate Δr in terms of D and of ΔY; having obtained Δr, we may calculate ΔG with the aid of equation (32).

$$D = (1 - c)(1 - r)\Delta Y - (1 - c)(Y + \Delta Y)\Delta r \tag{24}$$

$$(1 - c)(Y + \Delta Y)\Delta r = (1 - c)(1 - r)\Delta Y - D$$

$$\Delta r = \frac{(1 - r)\Delta Y}{Y + \Delta Y} - \frac{D}{(1 - c)(Y + \Delta Y)} \tag{33}$$

In this example, then, $\Delta r = .25417$, and $\Delta G = 300$.

TABLE VI

($\Delta G = 300$; $\Delta r = .25417$)

C	S	G	I	Y	T	X
720	180	100	180	1000	100	900
720	180	100	180	1000	354.170	645.830
516.664	129.166	400	180	1096.664	388.406	708.258
566.606	141.652	400	180	1146.606	406.093	740.513
592.410	148.103	400	180	1172.410	415.233	757.177
620	155	400	180	1200	425	775

If the increase in the tax rate precedes that in government spending, we have the development shown in Table VI.

In passing, we may observe another set of relations in figure 2. We have seen how income can be raised 200 with a budget of a 25 surplus. In the same fashion, we may maintain income constant while converting a balanced budget into a surplus. In figure 2, the schedules of which are constructed on the basis of an initial equilibrium income of 1000, the intersection of the $\Delta Y = 0$ and $D = -25$ curves shows the values of ΔG and of Δr which will leave $Y = 1000$ but will result in a surplus of 25 in the new equilibrium. But, as indicated earlier, D is the *change* in the budget: if, for example, initially the budget showed a deficit of 35, it would be changed to a deficit of only 10.

VIII

We may conclude with brief further reference to figure 2. In addition to the balanced budget, surplus budget, iso-income, and deficit functions discussed above, we have plotted the tax collection and disposable income functions. The ΔY curve is also the ΔG function, so the vertical distance between the ΔY and ΔT schedules at a given abscissa equals the deficit (or surplus) obtaining.

We have indicated on the ΔY curve the five routes illustrated in our discussion:

Route I—increase in G, r unchanged
Route II—G unchanged, r reduced
Route III—increase in G, r reduced
Route IV—G reduced and r reduced with a budget deficit
Route V—increase in G and in r with budget balanced
Route VI—increase in G and in r with a budget surplus

Obviously, there is an infinite number of alternative routes to increasing Y by 200, for we may move continuously along the ΔY curve, each point representing a different combination of ΔG and Δr. Indeed, we have arrived at a two-fold conclusion: (1) a given change in income may be obtained by means of any type of budget, whether balanced or a surplus or deficit of any size; (2) a given budget, balanced or unbalanced by any amount, may be used to obtain any desired change in income. In general, which type of route is best? Is it desirable to move upward to the right on the ΔY curve, or downward to the left, from a given starting point?

We may, for present purposes, simplify the problem by abstracting from apparently non-economic considerations; but the answer is still ambiguous. Several economic criteria are evident from even this simple model. Probably most observers would agree that, other things the same, it is desirable (a) to have a smaller deficit or a larger surplus, (b) to lower the tax rate, (c) to lower government spending, and (d) to increase disposable income. But other things are not the same, for these ends are not mutually consistent: moving to the left in figure 2 (down the ΔY line), we satisfy criteria (b), (c), and (d), but not (a); moving to the right, we satisfy the first criterion, but not the other three. And the matter can scarcely be convincingly settled by comparing the number of "plus" criteria with the number of "minus" ones. There are many routes to full employment, and making a choice by means of an index composed of an incomplete list of unweighted elements might be worse than a purely random selection.

THE UNION SHOP AUTHORIZATION REFERENDUM

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The trade union may be thought of as an organizational entity with an existence separate and apart from the members who give it life. From a legal point of view, federal legislation has recognized the union as a sufficient entity which can sue or be sued in a court of law; sociologically, the union may be thought of as an institution with its own survival requirements, one of which is to command the loyalty of its members who may regard the maintenance of the organized groups as an end in and of itself. The basic purpose of the union, however, is to act as a collective bargaining agent in determining wages and working conditions under which each individual worker performs his daily tasks. The union, therefore, must also be a political government where constituents elect representatives to act for them in the name of the organization.

As with any other type of representative government, union officials may be responsive to the will of the group, or they may be dishonest, venal and interested only in their own advancement, or alternatively, their concern may be primarily with the institution of the union itself, at their own or the members' expense. All three interests may, of course, coincide and a particular course of action might be beneficial to membership, satisfy the ego-drives of the leadership, and forward the cause of the union. It is not difficult, however, to construct circumstances where the interests of workers, officials and the institution of the union diverge.

Increasingly in recent years, interest has grown in the union's role as collective bargaining agent and questions have been raised about whether union officials have been placing personal or institutional interests above those of the membership. Specifically, inquiries have been raised about strikes in both the Smith-Connally[1] and Taft-Hartley Acts.[2] The war-time Smith-Connally Act provided for a thirty-day "cooling-off" period at the end of which time workers were asked to vote on whether or not they wished to authorize a walk-out. Under the Taft-Hartley Act, the President is authorized to seek an eighty-day injunction to postpone a strike which would tend to imperil national health or safety.[3] While the injunction is in effect, employees vote on whether to accept the employer's last offer. A negative vote allows the union to pursue the strike at the end of the injunction's term.

In early 1954, President Eisenhower asked Congress to extend strike authorization votes to all industries covered by the federal statute.[4] He spoke of the im-

[1] *War Labor Disputes Act*, 50 U. S. C. A. Appendix, 1501–1511.

[2] *Labor Management Relations Act of 1947*. Public Law 101, 80th Congress, 1st Session, H. R. 3020. 29 U. S. C., Secs. 141 et seq.

[3] Title II, Secs. 206–210.

[4] President Eisenhower's Labor Message to Congress, January 11, 1954. The full text of the message was reprinted by the *New York Times*, January 12, 1954, p. 9. The text also appears at 33 LRR 200.

portance of the decision to strike and asked that each employee be given, "an opportunity to express his free choice by secret ballot held under Government auspices." The Congress considered, but did not pass, a bill[4] which would have compelled strike votes after a walkout had begun. Strikes which failed to secure majority support would not have been banned but the union would have been deprived of the protection afforded by the National Labor Relations Act.

Governmentally-supervised elections on collective bargaining matters have not been confined to strikes. Under the Taft-Hartley Act, as originally passed, a referendum procedure was established to determine whether workers wished to authorize their bargaining representative to negotiate for a union shop or some milder form of union security.

Such legislation casts doubt about the ability or willingness of the union officials to reflect accurately the wishes of their constituents. This would appear to be the prime issue, since, in none of the cases, were strikes or the union shop flatly prohibited. Their approval, rather, was conditioned upon the members' will as expressed in a ballot conducted under other than union auspices. As is well known, the results of the war-time strike votes and the union shop referenda were overwhelmingly in favor of both the strikes and the union shop,[5] and eventually Congress consented to repeal the ballot procedures—although emergency dispute votes are still retained in the Taft-Hartley Act.

The purpose of this paper is to inquire into the union shop authorization referenda as an interesting case example of a governmental attempt to solve the possible conflict of interest among workers, union officials and the union over this one collective bargaining item. It will be contended that this attempt failed principally because it was wrongly conceived in the first place. Although government certainly exhibits a legitimate concern over this problem, its attack ought to be made frontally on the problem of union democracy. Hedging collective bargaining demands with elections which give the appearance of membership sanction to provisions towards which the group may be quite indifferent cannot possibly provide the answer. The discussion will be in terms of the union shop but much the same analysis would apply to similar votes on other items on the collective bargaining agenda.

I

As finally passed, the Taft-Hartley Act required a union to take the following steps if it wished permission to ask for a union shop:[7]

[4] S. 2650 introduced by Senator H. Alexander Smith on January 11, 1954.

[5] Of the 2,168 polls conducted from 1944 to 1946 under the Smith-Connally Act, 1,850 resulted in an authorization for a strike. Of 1,926,811 valid votes cast, 1,593,937 favored a strike.

Statistics on the union shop authorization referenda are given below in Table 1.

The national emergency disputes section of the Taft-Hartley Act has been invoked only 11 times. This hardly affords sufficient experience with which to generalize, especially since in 8 of these cases no votes on the employer's final offer were taken. Of the three cases in which votes were held, the employees rejected the offer in two cases while in the third some of the principal unions involved boycotted the balloting. A listing of the emergency disputes

1. It had to achieve recognition as the exclusive collective bargaining agent of the employees to be covered by the agreement.

2. At least 30 per cent of the employees in the union were to sign a petition to the National Labor Relations Board asking for a referendum on the question of whether the union should be authorized to ask for the union shop.

3. In such an election, a majority of the employees eligible to vote had to authorize the union to demand the union shop.

It should be recognized that favorable accomplishment of all these steps merely gave the union authority to ask for the union shop; management assent was still necessary before the clause could go into effect.

These provisions were essentially a compromise between those who wished to prohibit all forms of union security and others who wanted the issue to remain in the collective bargaining forum without any governmental interference. On the floor of the Senate, supporters of the bill had to meet attacks from both sides. A minority report on the bill claimed that any restrictions on union security would impair fundamental rights of workers.[8] Senator Smith, a member of the Senate committee which reported the bill, denied this,[9] claiming that workers wanted some such protection of their freedoms. He spoke of letters received from workers and their wives which detailed the desire for some way in which they could freely express their opinion on such matters.

On the other side, Senator Taft, chairman of the committee, was compelled to defend the provisions against those who proposed amendments to abolish all forms of union security.[10] He pointed out[11] that the union shop was the customary form of employment in the United States and that the referenda would effectively remove the evil of having union leaders asking for it merely to have more power over membership.

Once in effect, labor organizations were quick to utilize the election machinery. As indicated in Table 1, from August 1947 to the end of the fiscal year, June 30, 1948, nearly 18,000 polls were conducted and the union shop was rejected in only 357, or slightly less than 2 per cent of the cases. Valid votes were cast by 88 per cent of the eligible voters and of these more than 94 per cent were in favor of the union shop.

Within the year, management, labor and National Labor Relations Board

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up to 1952 can be found at 31 LRRM 120. The single case since then (up to July, 1954) was the New York dock dispute in which an injunction was issued on October 5, 1953. No vote was taken in this case because of the inability of the Board to present any meaningful "employer's final offer" in what was essentially an inter-union dispute.

[7] Section 8 (a) (3).

[8] Senate minority report on S. 1126.

[9] 93 *Daily Congressional Record*, 4412, April 30, 1947.

[10] Senator Joseph Ball introduced two bills which would have abolished the proviso in Section 8 (3) of the Wagner Act and hence would have eliminated all forms of union security. These were S. 105 and S. 360. When S. 1126, the bill which later was to become the Taft-Hartley Act, was being discussed on the floor of the Senate, Ball again attempted unsuccessfully to accomplish the objective of banning the union shop by introducing amendments from the floor.

[11] 93 *Daily Congressional Record*, 5087, May 9, 1947.

TABLE 1

Results of Union Shop Authorization Polls Conducted August 22, 1947–October 22, 1951[1]

Fiscal Year	Total No. of Polls	No. of Polls in which Union Shop Was Rejected	Percentage of Polls in which Union Shop Was Rejected	No. of Employees Eligible to Vote	Total No. of Valid Votes Cast	Percentage Casting Valid Votes	No. of Votes Cast Against Union Shop
Total	46,146	1,323	2.9	6,545,001	5,548,982	84.8	475,740
1948	17,958	357	2.0	1,852,333	1,629,330	88.0	94,350
1949	15,094	493	3.3	1,733,922	1,471,092	84.8	89,263
1950	5,589	213	3.8	1,072,856	900,807	84.0	95,647
1951	5,964	205	3.4	1,623,375	1,335,683	82.3	171,540
1952 (to Oct. 22, 1951)	1,561	55	3.5	262,515	212,070	80.8	24,940

[1] Adapted from Seventeenth Annual Report of the National Labor Relations Board, 1952, Table C-6, p. 306.

spokesmen began to express the opinion that the election provisions ought to be scrapped.[12] Repeal was finally accomplished in October 1951,[13] after more than 46,000 elections had been held in which the union shop was rejected in less than 3 per cent of the cases, (Table 1). As sometimes happens in the case of compromises, this one satisfied neither side and both were willing to let the provisions pass into limbo.

II

It is commonplace to recognize that statistical data, in and of themselves, can prove nothing. To some union representatives, the election results proved that workers had confidence in their leaders and the whole experience was regarded as a salutary demonstration of the fact that the union shop had not been imposed upon the rank and file.[14] Management spokesmen were able to look at the same body of data and reach quite different conclusions. It is interesting to examine their reasons for discounting the apparently conclusive results.

One class of reasons advanced for the unions' success in these elections revolve about such matters as the phraseology of the question[15] or the physical location of key words on the ballot.[16] It was claimed that the average worker found it difficult to understand the question which was expressed in legalistic fashion.

[12] See discussions in *Hearings Before the Joint Committee on Labor-Management Relations on the Operation of the Labor-Management Relations Act of 1947*. 80th Congress, 2nd Session, Parts I and II. (In subsequent notes these hearings are referred to as *Joint Committee Hearings*.)

[13] *Public Law 189*, ch. 534. Passed in the 82nd Congress, 1st session and approved October 22, 1951. This law had bipartisan sponsorship and was based upon S. 1959 introduced by Senators Taft and Humphrey on August 6, 1951. (97 *Daily Congressional Record* 9468.)

[14] See the testimony of William Green, pp. 1034, then President of the AFL, and Arthur Goldberg, General Counsel, CIO, p. 594. Both in *Joint Committee Hearings*, Part 2.

[15] *Ibid*, Part 1, p. 59.

[16] Letter of J. H. Beatty, Supervisor, Employee Relations, Champion Spark Plug Co. *Ibid*., Part 2, p. 1206.

Also, since the name of the union was inserted in a space immediately above the blanks which had to be checked yes or no, it was argued that some workers interpreted the question as requiring an expression of opinion on the *union* rather than the union shop.

Other explanations for the results dealt with such matters as the size of the bargaining unit or its previous union security status. It was alleged that most elections took place in small units or in situations where the union was reasonably sure of the results because the plants already had union shops.[17] These objections do not define the term "small", nor do they explain why size should be a significant variable in union success. As time progressed, units of all sizes went through the election machinery and, if anything, "smaller" units apparently rejected union security with greater frequency. Of 135 elections lost by unions in the period, February 1 to April 30, 1948, only one was held in a unit having more than 500 workers.[18]

As to the matter of previous union security status, it must be realized that unions had to be recognized as collective bargaining agents before being eligible for these elections. In light of the prevalent nature of union security provisions in collective bargaining agreements,[19] it was likely that many of the existing units did have experience with such clauses.[20] But, since the argument was that the elections were designed to protect workers from having compulsory membership provisions imposed on them, it seems curious that an existing union security clause would condition employees to vote for its retention.

An attempt was made to account for the results by citing union pressures on workers and distortion of the issues through misleading campaign literature. In the NLRB's sample analysis of elections held in the spring of 1948, it was found that unions issued literature in 88 cases and failed to do so in 2,102 instances.[21] Of course, distortion or even coercion can come about in other ways and undoubtedly was present in some cases. Yet, it should be noted that these elections were held under the same rules as ordinary collective bargaining representative determinations[22] where the Board's function is to prevent such occurrences. As always, this is a two-sided proposition and the Board did have occasion to set aside an election in which the employer interfered to render "improbable a free and untrammeled choice" on the part of employees.[23]

The timing of the elections was considered as an explanation of the one-sided

[17] Testimony of Raymond S. Smethurst, Counsel, the National Association of Manufacturers. *Ibid.*, Part 1, pp. 130–132.

[18] *Ibid.*, Part 1, p. 59.

[19] See, *Extent of Collective Bargaining and Union Recognition*, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin 909, June, 1947.

[20] Of the 2,201 elections held during the period May 6–May 21, 1948, 2,025 were held in units which had prior union security contracts. *Joint Committee Hearings*, Part 1, p. 63.

[21] *Ibid.*

[22] *Sixteenth Annual Report* of the National Labor Relations Board, 1951, p. 137.

[23] In this case the employer circulated a notice stating that regardless of the outcome of the election he would not sign any contract with a union security clause. *F. W. Woolworth Co.*, 93 NLRB 992.

results but various employers disagreed about the correct time for the balloting. The Act, itself, was not specific on this point except that the elections had to precede the effective use of the union security clause. Since the purpose of the balloting, however, was to decide whether the union had the right to demand the union shop, presumably, the appropriate time for the elections was sometime before collective bargaining negotiations got underway. Actually, some employers and unions agreed to a union shop first, to be effective only if the balloting, held sometime later, was in favor of the provisions. In an administrative ruling, the General Counsel of the NLRB approved this procedure,[24] possibly as means of alleviating some of the pressures on the Board.

This procedure was criticized on the grounds that prior employer agreement could not help but influence workers by casting an aura of approval over the union shop. It was argued that workers tended to go along with an arrangement which had been agreed to by both the boss and the union.[25]

On the other hand, it was claimed that elections should be held only after the employer and the union had firmly agreed to the union shop.[26] Something more than mere timing is involved here since, under this scheme, an election could not be held unless the employer first agreed to the clause in collective bargaining. This would have prevented the union from using the vote as a bargaining lever since the purpose of the election would be merely to ratify a collective bargaining decision after it was made. Whether this procedure would have altered results is difficult to say, but it probably would have cut down the number of elections.

A variant of this procedure designed to place more decision-making power in the referenda was suggested. It was proposed[27] that the workers be allowed to choose from among a number of union security clauses proposed by either the union or the management. Apparently the winning clause would be automatically inserted into the collective bargaining agreement. If such a procedure had been in effect it would have presented some wonderfully difficult problems for the NLRB which was already overloaded with administrative burdens. Imagine run-off elections between the two top clauses, and the difficulties of explaining the distinctions between an agency shop and a harmony clause, etc!

None of these explanations for the results seem overwhelmingly convincing; but to reject them is not to accept the unions' explanation that the balloting showed the workers' warm appreciation of the benefits of union security. Neither is the fact of congressional repeal evidence that the provisions were necessarily inappropriate. Congress' action was probably influenced by the pleas that the administrative burden on the NLRB was too great; that the election procedures could not be adapted to particular industries; and that the elections were a waste of funds since the results were so one-sided.[28]

[24] Release dated March 4, 1948.

[25] Testimony of Cornelius J. Petzhold, Attorney. *Joint Committee Hearings*, Part 2, p. 852.

[26] Testimony of Theodore Iserman, Attorney. *Ibid.*, Part 2, p. 858.

[27] Letter of Dan Hay, Employers' Representative in the Field of Labor Relations. *Ibid.*, Part 2, pp. 1246–1248.

Each of these arguments could be answered by opponents of repeal. While the administrative burden was great, reference to Table 1 shows that it was constantly decreasing since elections had to be held but once during the tenure of a union as collective bargaining agent. Certain industries such as the amusement and construction trades presented difficult problems but these industries in which employment is casual and intermittent never did fit comfortably into our basic labor relations framework. The whole idea of allowing workers to choose a bargaining agent by majority vote presupposes a stable work force which stays in one place long enough to exercise the franchise. This was not always true in the building trades, for example, where craftsmen may work for one employer until a job is finished and then move on to another job and another employer. In unionized areas the problem usually was "solved" by the labor organization entering into a prehire agreement with the contractors which provided for the closed shop. This was not illegal under the Wagner Act and, even if it did violate the statute, it might not have mattered too much since the NLRB, in its administrative discretion, chose not to exercise jurisdiction over local construction employment. The union security provisions of the Taft-Hartley Act, however, made it obligatory on the part of the Board to assume jurisdiction, but a feasible method of conducting these authorization elections never was discovered. In one election involving 2,483 workers in the building trades it cost the government approximately $16 a vote to discover that over 90 per cent of the votes favored union security![29] The difficulties connected with these trades must be conceded,[30] still, to throw the whole procedure out on their account was certainly letting the tail wag the dog.

The fact that the results in all industries were one-sided became obvious fairly early in the game, but if the principle was sound, the results would seem to be beside the point. Elections are not abolished simply because one side or the other consistently wins. Expense is surely a consideration, but here again, if the basic principles are sound, the expenditure of funds would seem to be in a good cause. As Senator Smith pointed out, [31] "Democracy has never been considered to be inexpensive."

[28] These arguments in favor of repeal were summarized by Raymond Smethurst. *Ibid.*; Part 1, p. 132. It should be noted that Smethurst was not in favor of amending the Act by eliminating the referenda provisions.

[29] *National Labor Relations Act of 1949*, Report No. 99 to accompany S. 249, 81st Congress, 1st Session, p. 17.

[30] These difficulties were only partially solved when the union security authorization elections were abolished since the Act still did not allow the closed shop. President Eisenhower, in his Labor Message to Congress (January 11, 1954, *op. cit.*), asked that employers in the construction, amusement and maritime industries, "be permitted to enter into a prehire contract with a union under which the union will be treated initially as the employees' representative for collective bargaining." He also recommended that the parties be permitted to make a union shop contract under which an employee was to become a union member after seven days of employment instead of waiting the thirty days as in other industries. Although these recommendations never were translated into law, they do provide a clue as to how these trades could have been singled out for special treatment on the union security authorization issue.

[31] *Joint Committee Hearings*, Part 1, p. 84.

The reasons advanced for repeal and the explanations offered for the results both seem to miss the point. Possibly, the results can be accounted for on the grounds that the elections were measuring something quite different than the workers' desire to authorize their agents to ask for a union shop. If this was so, then reasons for throwing out the procedure become obvious. One doesn't need an elaborate rationale for not using a thermometer for measuring barometric pressure. All that is necessary is to show that, while it might do a fine job in recording temperature changes, it is of little aid in determining air pressure. Perhaps these elections were a fine gauge of the heat of the workers' sentiment toward unions without telling us very much about their attitudes towards the union shop. At the very least, such an idea ought to be explored.

III

An analysis of the total meaning of the election experience requires some hypothesis as to congressional purpose in requiring these referenda in the first place. Possibly Congress wanted to afford workers some opportunity to express their individual opinions on the question of whether their representatives should be allowed to present a demand for the union shop. Such an assumption, innocent enough, implies that some general defect existed in the communication mechanism between the rank and file and union officials. Obviously, this would have to be a general defect since an occasional breakdown in particular unions would hardly justify over-all legislation. It might have been thought that union leaders didn't know, or couldn't know, the wishes of the rank and file and that the results of the referenda would enlighten and aid them in the task of negotiating agreements more nearly in accord with members' wishes.

Perhaps, on the other hand, Congress felt that the union leaders knew rank and file sentiment well enough but were deliberately ignoring it in deference to their concern with the union as an organizational entity rather than an institution serving the needs of workers. This would seem to imply that workers were against the union-oriented demand perhaps because of lack of concern over the maintenance of the strength of the union per se, or because of their superior concern over their rights to join or not join the organization as they desired. Further, the assumption that union leaders were not responsive to workers' demands would seem to imply some breakdown in the democratic election machinery and also the democratic procedures for ratifying the contract provisions once negotiated.

If one or both of these hypotheses were the basis of congressional action, the remedy indicated, the referendum, was peculiarly unsuited to correct the defects. Consider that these elections are held at about the time when collective bargaining negotiations are taking place. The workers are presented with a ballot on which they are called upon to check either yes or no. No matter how the wording is phrased, it is likely that one choice is interpreted as being for the union and the other against the union and for the company. Congress, apparently, was trying to expose workers' sentiment as individuals without full recognition of the fact

that any collective bargaining issue also has an institutional aspect. A worker can be against the union shop as an individual and yet vote for it because of his legitimate desire to do nothing which will weaken the union or strengthen the company. Such elections tend to put members on the spot by forcing them to choose, not necessarily on the grounds of the abstract desirability of compulsory membership provisions, but rather on the basis of strengthening or weakening an agency which is designed to secure economic and other benefits.

Changes in the wording of the ballot, in its typographical composition or even in the timing of the elections, would seem to be largely irrelevant to the basic issue. The true attitude of workers on the question of the union shop is not exposed in these polls; all that is tested is the direction of the loyalties of the workers. It is not surprising to find that, in the overwhelming majority of cases, workers tend to identify themselves with the organizations which, in most cases, they freely voted for as collective bargaining representatives in the first place.

Union officials should welcome these public demonstrations of faith which lend an aura of approval to union-oriented demands towards which workers may actually be quite indifferent. The willingness of union leadership to consent to the repeal of the election provisions can only be chalked up to their obsession that anything connected with the Taft-Hartley Act must necessarily be bad.

All this is not to deny that government should be actively and continually concerned with the problem of union democracy. Unions have no warrant, today, to consider themselves as private clubs, immune to governmental regulation. Our political traditions and the acute importance of the subject matter of collective bargaining which concerns an individual's livelihood compels the union's use of democratic procedures. If Congress feels that the lack of democracy in the internal decision-making procedures of unions constitutes a problem, then this should be attacked frontally. Perhaps the law ought to require regular secret elections of union officials at periodic intervals, perhaps some avenue of appeal ought to be granted workers disciplined by unions, perhaps present provisions for assuring open unions ought to be strengthened, etc.

The important thing here is that the attack be made directly on the problem of internal democracy within unions and that it not be confused in any manner with collective bargaining procedures. It must be kept as a problem which concerns workers, officials and the union. Once management is brought into the picture, the differences between workers and officials diminish in light of the external threat to the institution of the union to which, apparently, both rank and file and leaders are devoted.

Advocates of governmentally supervised votes on questions of strikes, acceptance of the employer's last offer, or union security do a disservice to both union democracy and collective bargaining. One suspects that they would like to see each worker making his individual decisions about whether he will go out on strike or accept a particular contractual item. But testing individual sentiment by impartial poll takers is an anachronism under our present-day collective bargaining framework. We have accepted the union as a representative of workers

for purposes of collective bargaining. Having done so, the public interest would seem to be legitimately concerned about whether the union is democratically run but, once such inquiries have been made and appropriate action taken, the union must be left alone to do its job of representing. We cannot demand that it do a responsible job of representing its constituents and at the same time constantly probe for the sentiments of individuals. We delude ourselves into thinking that we are testing the existence of democracy whereas we are merely asking for a poll of loyalties.

CHANGING N. L. R. B. POLICIES: 1953-1954

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Perhaps the most outstanding feature of the operation of the National Labor Relations Board during the past year has been its reversal and modification of previous Board policies. Basic to this development, of course, is the fact that President Eisenhower since July, 1953 has appointed three new members to the five-man agency.[1] When the present chairman of the Board, Guy Farmer, received his appointment in July, 1953, he declared that landmark decisions of the Board "ought to be fully reexamined by the Board whenever cases with the same problems come up."[2] In the past several months the new Board[3] not only has reviewed past policies established by previous N. L. R. B. action, but it has also established many new doctrines which have upset a number of long-standing Board precedents.

The fact that policies change with changing personnel is nothing new with quasi-judicial government agencies. It is commonplace to point out that legislation dealing with broad social and economic problems can be interpreted and applied in many ways. In legislation such as the Wagner Act and the Taft Hartley law Congress lays down broad legal principles and places the responsibility on administrative agencies and the courts to interpret and apply these comprehensive statements of public policy. Accordingly, it is to be expected that changing personnel in an administrative agency will result in new interpretations and application of such legislation.

Even before the new N. L. R. B. members were appointed, the Board had altered policies concurrent with changing personnel. An outstanding example in this connection was the change in Board policy on foreman bargaining rights during World War II.[4] N. L. R. B. policy on this problem changed three times within a short period of time, the key to its vacillation on the issue being the appointment of new personnel. Accordingly, the new Board has not blazed a new trail in administrative law by altering previous doctrines. What is significant, however, is the rapidity and the scope with which the Board has moved in this

[1] Guy Farmer was appointed chairman of the N. L. R. B. on July 13, 1953, replacing Paul M. Herzog who resigned. Philip Ray Rodgers took office on August 28, 1953, replacing John M. Houston, whose term expired, and on February 18, 1954 Albert C. Beeson filled the vacancy created by the resignation of Paul L. Styles. The term of Beeson expired on December 16, 1954, following his announcement that he would not accept appointment. President Eisenhower appointed Boyd Leedom to fill the vacancy. Board members Abe Murdock and Ivar H. Peterson appointed to the Board by former President Truman complete the five-man agency.

[2] *New York Times*, July 13, 1953.

[3] For purposes of this paper, the "new Board" refers to the Board headed by Guy Farmer.

[4] See my *Wartime Experiences of the N. L. R. B.* (Urbana, Ill.: University of Illinois Press, 1949), pp. 173-194.

direction. Never before in the 18 years' history of the N. L. R. B. has it upset and modified so many previous policies in such a short period of time.

What this paper aims to accomplish is to highlight a number of important new policies of the Board which have either upset or significantly modified previous doctrines. Some of the development behind these new policies will be identified and, finally, there will be some appraisal of how these new doctrines affect the rights and duties of employers, employees, and labor organizations. For purposes of classification, the new policies of the N. L. R. B. can be reduced to three broad categories: those applying to (1) representation elections; (2) jurisdiction of the Board; and (3) craft workers' representation rights.

Representation Elections

Under the terms of the Taft Hartley law, the National Labor Relations Board has the duty to determine whether or not employees classified into bargaining units desire collective bargaining representation. If a union obtains a majority of votes cast in an N. L. R. B. election, the organization is certified for collective bargaining, and employers are under the legal obligation to bargain collectively with the labor union. Conversely, when a labor union fails to obtain a majority of the votes cast in such an election, the employer does not have any legal duty to bargain collectively. For all practical purposes, collective bargaining does not take place when a union loses an election. Accordingly, the policies which the Board adopts in connection with the representation election are of first-rate importance since the outcome of the polls determines whether or not collective bargaining relationships will be established.

The most significant of the new Board's decisions regarding the representation election deals with "new look" which the Board has taken of the "captive audience" doctrine. On December 21, 1953, the Board decided the *Livingston Shirt Company* case[5], and thereby reversed the *Bonwit Teller*[6] doctrine, the policy which had governed the N. L. R. B. position on the captive audience for several years. Some employers utilize the captive audience technique just before a representation election is held. The procedure involves the compulsion of workers to attend a meeting for the purpose of listening to employer delivered speeches. The captive audience is conducted on company property and on company time, the workers being paid for listening to employer speeches. Coming just before the bargaining election the use of the captive audience strategy could have a telling effect on the outcome of the balloting.

The problem of the captive audience has always been troublesome to the Board. Toward the end of the Wagner Act era the N. L. R. B. held that employers commit an unfair labor practice when they made use of this procedure.[7] Subsequently the courts upheld this position of the Board.[8] After the passage of the Taft Hartley law, however, the Board reversed this policy and the captive

[5] *Livingston Shirt Corporation, 107 N. L. R. B.* No. 109 (1953).
[6] *Bonwit Teller, Inc., 96 N. L. R. B.* 608 (1951).
[7] *Clark Bros. Company, 70 N. L. R. B.* 802 (1946).
[8] *N. L. R. B.* v. *Clark Bros. Company*, 163 Fed. (2d) 373 (1947).

audience became a lawful instrument.[9] The basis of the ruling was the impact of section 8(c), the so-called free-speech provision of the 1947 labor law.[10] In 1951 the Board again dealt with the captive audience problem, and established the celebrated *Bonwit Teller* doctrine. This time the Board held that when a company denies a labor organization the right to campaign on company property the employer commits an unfair labor practice, if he addresses a captive audience without giving the union an opportunity to reply at the meeting. The N. L. R. B. had previously ruled that retail and department stores, like the Bonwit Teller Company, had the privilege of prohibiting union activities, such as the solicitation of union members in the selling areas of these establishments even when the activities were not carried out on company time.[11] In all other establishments the Board and the courts have held a union may engage in union activities on company property providing that such activities were not carried out on company time and did not interfere with production.[12] The rationale for the special policy on union activities in retail and department stores involves the characteristics of the way they must carry out their business. Since the Bonwit Teller Company enforced a general no-solicitation rule and made use of the captive audience technique, the Board held that the employer should have given the union an opportunity to reply to the workers once they were assembled and addressed by the employer.

Though the principle of union reply to captive audiences was first established in the department and retail store industry, the Board quickly moved in the direction of requiring employers throughout industry to permit unions to have the opportunity to reply to company speeches delivered to captive audiences. The Board ruled that unions should be given the opportunity to reply even where it is illegal for employers to enforce a general no-solicitation rule on company property. In a case involving a pottery company, for example, the Board found an unfair labor practice when the employer used company property and time for speeches the day before a representation election while denying the union similar rights to address the captive audience.[13] Another proceeding involved a textile manufacturing company, and the Board held the labor organization had a right to reply to an employer's captive audience speech made two hours before the polls opened, especially when the employer did not permit union members to ask questions during the talk.[14] Another case following in the wake of the *Bonwit Teller* doctrine centered around a hardware manufacturing company.[15] In this instance, the record shows that employee attendance at a meeting held five

[9] *Babcock and Wilcox*, 77 *N. L. R. B.* 577 (1948).

[10] Section 8(c) reads as follows: "The expressing of any views, arguments, or opinions, or the dissemination thereof, whether in written, printed, graphic, or visual form shall not constitute or be evidence of an unfair labor practice under any of the provisions of this Act, if such expression contains no threat of reprisal or force or promise of benefit."

[11] *Famous-Barr Company*, 59 *N. L. R. B.* 976 (1945).

[12] *Republic Aviation Corp.* v. *N. L. R. B.*, 324 U. S. 793 (1945).

[13] *Onondaga Pottery Company*, 100 *N. L. R. B.* 1143 (1952).

[14] *Biltmore Manufacturing Company*, 97 *N. L. R. B.* 905 (1951).

[15] *Belknap Hardware and Manufacturing Company*, 98 *N. L. R. B.* 484 (1952).

hours before the polls opened was not compulsory. Still the Board found an unfair labor practice because it concluded that the workers thought their attendance was required, and the company did not give the union opportunity to reply to an employer speech delivered at the meeting.

The policy of requiring reply time for unions, however, was abruptly extinguished when the Board handed down its decision in the *Livingston Shirt Company* case. By a 3–1 majority[16] the N. L. R. B. reversed the *Bonwit Teller* doctrine, and held that employers may deliver speeches to captive audiences without providing unions with reply time. To justify its position the new Board reasoned that the employer's right to free speech does not have real meaning if he is required to give time to unions to reply to captive audiences. In this connection the Board declared that "if the privilege of free speech is to be given real meaning it cannot be qualified by grafting onto it conditions which are tantamount to negation." Moreover, the Board believed that union organization activities would not be "unduly hindered" by refusing labor unions the opportunity to address captive audiences because "there remains open to them all the customary means for communicating with employees."

In contrast with the majority point of view, Board Member Murdock, who dissented in many of the cases decided by the new Board, believed that the majority action did not encourage collective bargaining. On this point he declared: "I cannot believe that the majority's action in holding that an employer may lawfully monopolize the most effective forum for persuading employees is consistent with the declared Congressional policy which is not that of neutrality but of encouraging the practice and procedure of collective bargaining. Practically every employer speech on company time and property is designed to perpetuate individual bargaining and to discourage collective bargaining." Indeed, the fundamental basis for the dissent of Murdock in many of the recent decisions of the N. L. R. B. rests upon what he believes to be their inconsistency with the public policy of encouraging collective bargaining. Murdock further declared in the *Livingston Shirt* case that no organizational method of a union can effectively counteract the use of the captive audience for the "dissemination of employer anti-union views." Finally Murdock believed that the *Bonwit Teller* doctrine did not interfere with the right of free speech of employers, stating that the doctrine "never prohibited the exercise of free speech by an employer at any time" and that the Board in the *Bonwit Teller* case did not find the employer speech to a captive audience an unfair labor practice but only his refusal to permit the union the opportunity to reply.

Though the Board no longer requires employers to provide an opportunity for unions to reply to employer speeches delivered to captive audiences, it did place a restriction upon the use of the technique. It held in *Peerless Plywood*,[17] a companion case to *Livingston Shirt*, that speeches to employees on working time are prohibited within 24 hours before representation elections. In establishing this

[16] The majority was composed of Farmer, Rodgers, and Peterson. Beeson was not yet appointed to the agency when the case was decided. Murdock cast the dissenting vote.

[17] *Peerless Plywood Company*, 107 *N. L. R. B.* 106 (1953).

policy, the Board declared that "we believe that experience in holding elections has shown that elections are likely to more truly reflect employee desires if the employees are afforded a brief breathing spell from employer or indeed union speeches at their place of work during working hours immediately before the election." Once again Murdock dissented arguing in part that this rule is inconsistent with the Board's position in the *Livingston Shirt* case. He claimed that a flat 24 hour prohibition on any employer's speech does not square with the concern that the Board demonstrated in the *Livingston Shirt* case for employer free speech. Murdock further asserted that since the *Bonwit Teller* doctrine never prohibited the exercise of free speech by an employer at any time he would not have "the temerity to begin doing so now by acquiescing in the new 24 hour prohibition."

Another limitation on the captive audience procedure established by the Board in the *Livingston Shirt* case, however, has been upset by a recent circuit court of appeals decision. In the *Livingston* case, the N. L. R. B. held that unions still must be afforded the opportunity to reply to captive audiences when a company enforces a general no-solicitation rule. As noted, such a rule may be legally implemented in retail and department stores, and it was within this industry that the Board first established the doctrine of reply time for unions. In a case involving the F. W. Woolworth chain, employer representatives made several speeches to workers on company time and property and refused their union opportunity to reply.[18] A general no-solicitation rule was in effect, and the N. L. R. B. in line with established policy held that the company committed an unfair labor practice when it denied the union the opportunity to address the captive audience. While refusing to enforce the order of the Board the Sixth Circuit Court of Appeals stated that "to decide that a no-solicitation rule deprives the employer of the right to confer with his employees about any important matters, including unionization, is to deprive him of the freedom of speech specifically guaranteed by the Constitution and by Section 8(c) of the Act." If this circuit court decision should ever be affirmed by the Supreme Court, the result will be that no employer, regardless of the character of the industry involved, and notwithstanding the application of a general no-solicitation rule, will be required to provide reply time to a union when he makes use of the captive audience technique.

Other recent decisions dealing with the representation election reverse previous principles of the N. L. R. B., though they do not measure up in importance to the Board's most recent policy on the captive audience problem. Previously the N. L. R. B. held that close relatives of employers were not permitted to vote in a representation election.[19] The basis for this rule is that such relatives have their sympathies with the employer and not with the employees. Hence such close relatives, it was reasoned, would likely vote against collective bargaining. This policy was upset by the new Board when it permitted close relatives of

[18] *N. L. R. B.* v. *F. W. Woolworth*, United States Court of Appeals, Sixth Circuit, No. 11882, June 3, 1954.

[19] *P. A. Mueller & Sons*, *105 N. L. R. B.* No. 74 (1953).

employers to vote in a representation election. In one case the Board allowed a brother of the two partners in business, their two nephews, two nephews by marriage, and a niece to vote in a bargaining election.[30] A mother-in-law of one of the owners of a business was permitted to vote in another case involving this issue.[31] The new Board held that close relatives of employers are not to be denied the privilege of voting as long as the record shows that they have no "special status" in the plant which would ally their interests with those of management. Thus, under new Board policy, close relatives of employers will not be denied the right to vote just on the basis of family relationship. Only when they have a "special status" in the plant which would ally their interests with the company and serve to alienate their sympathies with the workers will they be disfranchised.

In two other cases the new Board seriously modified former policies involving the substance of what employers may tell their workers before representation elections take place. For many years the Board operated under the principle that the results of an election in which a union loses could be set aside and a new poll ordered when it is shown that the employer or his agents established a sense of futility in the minds of the workers concerning the significance of the outcome of the election.[32] However, the new Board refused to set aside an election in which the labor union was not successful despite the fact that a company lawyer just before the polls opened told a group of workers that "it would not make any difference whether the union won the election or not, the company would not recognize it."[33] The union argued that the election results should be set aside on the grounds that the statement influenced the outcome of the poll. It claimed that some workers reflecting on the lawyer's statement undoubtedly felt that it would be useless to vote for the union since the company would not recognize it as a bargaining agent regardless of the outcome of balloting. The new Board neither was persuaded by these arguments, nor was it impressed by the long-standing policy on the issue. It refused to invalidate the results of the poll, stating that the lawyer's statement was an "expression of the company's legal position, which we find will not warrant setting aside the election."

In the second case dealing with employer pre-election statements, the new Board moved in the direction of upsetting a long-standing policy in the administration of the law that representation elections will be set aside where the facts show that an employer threatens to move his plant if the union wins an election.[34] The record in the case shows that the plant engineer told an employee "if the union wins the company will be forced to move the plant," and a foreman told

[30] *International Metal Products, 107 N. L. R. B.* No. 23 (1953).

[31] *Olden Camera & Lens Company, 108 N. L. R. B.* No. 9 (1954).

[32] *Metropolitan Life Insurance Company, 90 N. L. R. B.* 935 (1950).

[33] *National Furniture Manufacturing Company, 106 N. L. R. B.* No. 228 (1953).

[34] As noted in footnote 10 above, Section 8(c) though providing for the general protection of statements made to workers, still makes it unlawful for persons to make remarks containing threats of reprisal or force or promise of benefits. The rationale for this policy is evidenced in a standard established by the Supreme Court that "pressure exerted vocally by the employer may no more be disregarded than pressure exerted in other ways." *N. L. R. B.* v. *Virginia Electric Power Company*, 314 U. S. 477 (1941).

another worker, "the boss can move the plant if he wants to."[25] After the union lost the election, it petitioned the N. L. R. B. to have the results set aside and a new election ordered on the grounds that the statements were in effect threats to move the plant and that some workers probably voted against the union out of the fear that they would lose their jobs if the labor organization won the poll. However, the Board declared that the statements did not constitute a threat but were only a "prophecy" that the employer might move his plant. In reaching this decision the Board was impressed by the employer argument that he could not pay the same wage scales that the union had obtained at another plant. The employer apparently believed that if the union won bargaining rights it would demand from him the same wage rates that it had secured from the other plant. Moreover, the Board did not require the company to present evidence as to why it concluded it could not afford to pay the same wage rates as the union managed to secure from the other plant.

Regardless of how the new Board's policies concerning representation elections are defended or criticized their impact on labor relations appears rather clear. They undoubtedly will operate to make it more difficult for labor unions to win bargaining elections. By providing employers with a greater opportunity to influence the votes of their employees prior to bargaining elections, the Board has established additional barriers that unions must overcome to gain collective bargaining rights.

It is significant that the percentage of collective bargaining elections in which labor unions won representation rights during the first quarter of 1954 has dropped sharply as compared to the experience during the fiscal year 1953 (July 1, 1952–June 30, 1953). In the first quarter of 1954 collective bargaining representatives were selected in 552, or 60 per cent, of the 878 collective bargaining elections which the Board conducted during the period.[26] In contrast, for fiscal year 1953 the unions were successful in 71 per cent of the 6,191 elections held by the Board.[27]

Undoubtedly there are a variety of theories which could be offered to explain the sizeable drop in union victories in the first quarter of 1954. It is likely, however, that the new Board's election policies have played an important part in producing this phenomenon. Certainly they do not make it easier for collective bargaining agencies to be selected in representation elections. If one holds that a fundamental objective of national labor policy is to encourage the practice and procedure of collective bargaining these new doctrines appear incongruous with that principle.

JURISDICTION OF THE BOARD

The manner in which the N. L. R. B. determines its jurisdictional boundaries has an important bearing upon industrial relations. Accordingly a set of recent N.

[25] *Chicopee Manufacturing Company, 107 N. L. R. B.* No. 31 (1953).

[26] N. L. R. B. Press Release, S-64, April 25, 1954, "N. L. R. B. Statistical Summary Covering the Three-Month Period January Through March 31, 1954," p. 2.

[27] N. L. R. B., *Eighteenth Annual Report* (1953), p. 7.

L. R. B. policies dealing with this issue is of great significance to employers, employees, and labor organizations. The common denominator of these new policies, all of which upset or modify long-standing doctrines of the Board, is that they curtail the scope of the Taft Hartley Act.

The importance of these new decisions is evidenced in the consequences resulting in N. L. R. B. refusal to assert its authority over a case. When the agency declines to take jurisdiction over a case it means, for example, that it will not conduct a bargaining election to determine whether or not collective bargaining representatives are to be chosen. It has the additional effect of allowing employers and unions to engage in activities illegal under national law without fear of government censure. In short, to the degree that the N. L. R. B. declines jurisdiction over cases, the application of national labor policy is proportionately limited. Benefits, obligations, or protection flowing from the Taft Hartley law become inoperative to the extent that the Board restricts its jurisdictional area.

For many years the N. L. R. B. assumed jurisdiction over public utility systems on the ground that their operations have an important bearing upon interstate commerce. Not only did this principle extend to privately owned systems, but the N. L. R. B. also took jurisdiction over rural cooperative electric utilities. On this point the Board once said: "We find . . . that a cooperative utility of the type involved herein should for these purposes (jurisdiction) be treated as a public utility."[28] Departing from this policy the new Board in November, 1953 declined jurisdiction over a rural cooperative electric utility, holding that the operations of the system did not exert a significant impact upon interstate commerce.[29] It reached this decision despite the fact that the utility annually purchased $150,000 worth of material from outside the state.

In the fall of 1953 the Board refused to apply the Taft Hartley law to a concrete company which purchased material from outside of the state in the amount of $133,000 annually.[30] The company sold the bulk of its products to the state of North Carolina for the maintenance of county roads. Though the Board conceded that the operations of the concrete company did affect commerce within the meaning of the Taft Hartley law, it declined jurisdiction on the ground that the impact of the company's operations on interstate commerce was not substantial enough for N. L. R. B. action. Long before this decision the Board had held that enterprises which supply $50,000 worth or more of materials or services to concerns that maintained or constructed public highways fell under the scope of the law.[31] Consequently under the present policy there is no assurance that firms which supply material for public highway construction or maintenance fall within the jurisdiction of the Taft Hartley Act.

In another jurisdictional case, the new Board refused to apply the law to a taxicab company which served three major Boston railway stations, and hauled passengers to and from the city's major airport.[32] The company earned annually

[28] *Cherokee County Rural Electric Cooperative Association, 92 N. L. R. B.* 1181 (1951).
[29] *Inter-County Rural Electric Cooperative, 106 N. L. R. B.* No. 238 (1953).
[30] *Johnson Concrete Company, 106 N. L. R. B.* No. 214 (1953).
[31] In this connection see *Depew Paving Company, 92 N. L. R. B.* 142 (1950).
[32] *Checker Taxi Company, 107 N. L. R. B.* No. 181 (1953).

about $584,000 revenue out of its total business of $2,500,000 from these activities. This decision upsets a traditional Board policy that taxicab companies servicing the terminals of interstate transportation systems are within the jurisdiction of the national labor law on the ground that they are essential links in interstate commerce. In a 1951 taxicab case, for example, the N. L. R. B. took jurisdiction over a company even though it earned only 6 per cent of its total business from trips to and from interstate bus, railroad, and airline terminals.[33] In the Boston taxicab case, the new Board held that the operation of the company had an insubstantial impact upon interstate commerce even though it earned about 23 per cent of its annual revenue from hauling passengers to and from the railway and airport terminals.

In two recent cases the new Board dealt with national defense establishments, and once again curtailed the operation of the Taft Hartley law. One of these cases involved a Florida milk company which annually sold $100,000 worth of milk to a naval installation and a veteran's hospital.[34] The Board refused to apply the law to the milk company on the ground that its operations do not substantially affect the national defense. Likewise the new Board refused jurisdiction over a small variety store located in the Los Alamos atomic energy installation.[35] It declined jurisdiction over the case despite the fact that the variety store operated on the atomic energy installation only upon gaining permission from the Atomic Energy Commission. These decisions tend to upset a policy previously established by the N. L. R. B. that enterprises which substantially affect the national defense fall within the scope of Taft Hartley. While applying this jurisdictional standard, the Board previously interpreted it in a very liberal manner. For example, in 1951 it took jurisdiction over a case involving a laundry and dry cleaning establishment operating on an atomic energy reservation.[36]

Two major factors appear to be the basis for the current jurisdictional trend of the N. L. R. B. In the first place, the new Board appears convinced that the national government should not intervene in jurisdictional cases such as those reviewed above, but that they should be resolved close to their origin. As the Board put it in one case, it should restrain a "bureaucratic impulse" to assert jurisdiction on such matters.[37] The implication is that the new Board feels that the states or even

[33] *Red Cab, Inc., 92 N. L. R. B.* 175 (1950).

[34] *McArthur Jersey Farm Dairy, 107 N. L. R. B.* No. 171 (1954).

[35] *Taichert's Inc., 107 N. L. R. B.* No. 167 (1954).

[36] *Richland Laundry & Dry Cleaners, 93 N. L. R. B.* 680 (1951). In this case the Board said: "Our decision that it would best effectuate the purposes of the Act to exercise jurisdiction here is based solely on the Respondent Employer's relationship to the national defense effort, arising from his license to do business on a United States reservation devoted to atomic energy. In the Board's opinion, any employer doing business on such an atomic energy reservation, whether or not his business is absolutely essential to the inhabitants of the community, is nonetheless so identified with the Government's national defense program as to warrant the full exercise of the Board's power to assert the jurisdiction conferred on it by the Act."

[37] Taichert's, Inc. cited in footnote 35 above. On the same issue, the chairman of the new Board declared "Uncle Sam's long arm has reached out to assert itself over too many labor-management situations which ought to be resolved closer to their origin." New York *Times*, November 8, 1953.

cities should resolve cases when the national agency decides that its assumption of jurisdiction is not appropriate. However, to the extent that states and cities do not have labor relations laws similar to Taft-Hartley, these cases cannot be handled closer to home. The fact is, of course, that no cities and only a handful of states have laws patterned after the national labor statute. This means that many employers, employees, and labor organizations will be permanently deprived of the benefits and protection inherent in a legal code regulating industrial relations and collective bargaining.

Secondly the new Board believes that it should not exert jurisdiction over small enterprises, even though their operations place them within the scope of Taft Hartley. Not only has this policy been implemented by decisions such as the one involving the variety store in the atomic energy installation case, but in June, 1954 the Board established a set of new rules which for all practical purposes places small firms beyond the scope of the law.[28] This necessarily means that the benefits, and protection of the Taft Hartley Act will be reserved only for employees and employers of large firms, and will not be available to employees and owners of small firms. If this new doctrine is deemed to be wise public policy Congress should amend the substance of Taft Hartley in order to provide legislative indorsement of the objective accomplished by administrative action. As the law now stands, it does not distinguish between large and small enterprises. The fundamental criterion contained in Taft Hartley for purposes of N. L. R. B. jurisdiction is not the size of a business, but whether or not its operations affect interstate commerce. Accordingly there is grave doubt that the new Board policy on small business carries out the intent of the Congress of the United States.

CRAFT WORKERS' REPRESENTATION RIGHTS: THE AMERICAN POTASH DOCTRINE

Perhaps no problem involving the establishment of the bargaining unit has given the N. L. R. B. more concern than the controversy regarding the bargaining rights of craft workers. The basis for the controversy involves, on one hand, the freedom of skilled workers to choose their own craft unions for collective bargaining rather than being included in a more comprehensive industrial bargaining unit, and on the other hand, the maximization of industrial efficiency which is encouraged by the more orderly and stable employer-union relationship inherent in the implementation of collective bargaining on an industrial basis. It is within the framework of this conflict that the new Board made its most important modification of previous bargaining unit policies. Fundamental to the importance of

[28] See N. Y. *Journal of Commerce*, July 1, 1954. Among the more important of the new jurisdictional standards for purposes of eliminating small business from the scope of the Taft Hartley law are: (1) to be subject to the law, an enterprise must annually sell $50,000 worth of goods in interstate commerce. Previously this figure was only $25,000; (2) under the new rules, the amount of goods and services that must be supplied to interstate companies to bring the supplier under the agency's jurisdiction is raised to $100,000 per year from $50,000; (3) the Board will no longer take jurisdiction over a firm merely because it operates under a franchise from a national enterprise; and (4) jurisdiction no longer will be determined by combining the percentages which a firm has in each of the dollar-volume categories.

Board policy in the establishment of the bargaining unit is the fact that a labor union certified by the N. L. R. B. becomes the exclusive bargaining agent for all workers within the bargaining unit. This could mean that a C. I. O. union might gain bargaining rights over a number of craft workers who otherwise would be represented by an A. F. L. union. Actually this circumstance has frequently occurred and has provided the basis for repeated and severe A. F. L. attacks against the N. L. R. B.

Early in its career the Board dealt with the craft representation problem and established the "globe doctrine."[39] Under this policy the N. L. R. B. permitted craft workers under some circumstances to vote in separate elections to determine whether or not they wanted separate representation or desired to be included within a wider industrial unit. Such a poll was held before the Board established the unit for collective bargaining.

This concession to the craft unions, however, did not deal with the problem of the bargaining rights of craft workers who were previously classified in an industrial bargaining unit. Indeed about two years after the Board established the "globe doctrine," it held that craft workers once classified in an industrial unit were permanently frozen in the unit. This principle was established in the celebrated *American Can Company* case.[40] In short, the Board refused to carve out craft unions from a broader bargaining unit already established.

The *American Can* doctrine remained unchanged until 1944 when the N. L. R. B. decided the *General Electric* case,[41] and therein made a major concession to skilled workers and the American Federation of Labor. In this case the Board held that craft workers previously included within a more comprehensive bargaining unit could vote in separate elections to determine whether or not they wanted separate representation. However, before ordering a craft severance election, the Board had to be satisfied that craft employees involved constituted a true craft and not a mere dissident faction; and that the craft workers maintained their identity through the period of bargaining upon a more comprehensive basis, and protested their inclusion in such a larger bargaining unit. Thus, under the *General Electric* policy the Board relaxed the rigid formula contained in *American Can*.

The next major development in the craft worker representation controversy resulted from the passage of the Taft Hartley Act. It provides that the N. L. R. B. may not decide that a craft unit is inappropriate for collective bargaining on the grounds that a wider unit has been established by a prior Board determination, unless a majority of the employees in the proposed craft unit vote against separate representation.[42] Although this provision of Taft Hartley reflects somewhat the policy that the N. L. R. B. established in the *General Electric* case, Congress made it a matter of substantive law that craft workers are not to be frozen in an industrial unit on the grounds of previous classification. Congress made sure that the rigid formula of *American Can* would never be revived.

In applying the craft worker representation feature of Taft Hartley, however,

[39] *Globe Machine and Stamping Company*, 3 *N. L. R. B.* 294 (1937).
[40] *American Can Company*, 13 *N. L. R. B.* 1252 (1939).
[41] *General Electric Company*, 58 *N. L. R. B.* 57 (1944).
[42] Sec. 9(b) (2).

the N. L. R. B. held that while the law precluded it from deciding that a craft unit was not appropriate upon the sole ground that a different unit had been established by a prior determination, it could consider other factors in deciding whether or not there should be craft severance elections. This construction of the Taft Hartley provided the basis for the *National Tube* doctrine established by the Board in 1949.[42] Under this policy, the agency refused to order craft severance elections within industries in which there was a high degree of integration of operations, and where collective bargaining was historically carried out on an industrial basis. After first refusing to carve out craft unions from industrial units within the steel industry, the Board applied the *National Tube* doctrine to the aluminum,[43] lumber,[44] and wet milling[45] industries. Where the Board applied the *National Tube* doctrine it permanently precluded any possibility of setting up craft units in an entire industry.

During the spring of 1954 the new Board dealt with the craft worker representation problem and established the *American Potash* doctrine.[46] In essence the new policy contains three major elements: (1) the *National Tube* doctrine will not be extended to new industries, though it will remain in force within the four industries in which it has already been applied; (2) with the exception of these four industries, the N. L. R. B. will permit craft severance elections when requested by a group of workers who qualify as craft workers under the standards laid down by the Board; and (3) the union petitioning for the craft severance election must traditionally represent the craft workers desiring separate representation. It is emphasized that the craft election will be ordered automatically upon petition of an appropriate union once the Board is satisfied that the workers asking for the election are craftsmen. The Board will not consider any other factor in deciding whether or not a craft severance election should take place. It will refuse to order a craft election only when the workers do not qualify as craftsmen or the petitioning union does not normally represent the skilled workers in question.

In establishing the *American Potash* doctrine, the new Board held that the *National Tube* policy did not reflect the intent of Congress. It said in this connection that: "the right of separate representation should not be denied the members of a craft group merely because they are employed in an industry which involves highly integrated production processes and in which the previous pattern of bargaining is industrial in character. We shall, therefore, not extend the practice of denying craft severence on an industry wide basis."

Though the *American Potash* doctrine precludes the extension of the *National Tube* policy, the new Board, as noted, made it clear that craft severance elections will not be ordered unless the workers petitioning for such a poll constitute a true

[42] *National Tube Company, 76 N. L. R. B.* 1199 (1949).
[43] *Permanente Metals Corporation, 89 N. L. R. B.* 804 (1950).
[44] *Weyerhauser Timber Company, 87 N. L. R. B.* 1076 (1949).
[45] *Corn Products Refining Company, 80 N. L. R. B.* 362 (1948).
[46] *American Potash and Chemical Corporation, 107 N. L. R. B.* No. 290 (1954). Farmer, Rodgers, and Murdock constituted the majority. Peterson, however, dissented from the majority position.

craft group. It laid down a number of standards to determine whether or not a group of workers would qualify for a craft severance election. Thus, a true craft group would be "one composed of a distinct homogeneous group of skilled journeymen craftsmen, working as such together with their apprentices or helpers." To be a journeyman craftsman for purposes of craft severance elections, the worker must have the kind and degree of skill which is normally acquired by undergoing substantial apprenticeship or comparable training. Once the Board decides that a group of workers fit these standards, it will permit them to vote on the issue of separate representation.

In a number of plants and industries, there may be many groups of skilled workers who can qualify under Board rules for craft severance elections. For example, in the paper and pulp industry it is estimated that there are as many as fifteen to twenty well defined craft groups.[48] If the Board follows the course it has set in the *American Potash* case, this means that as many as twenty different representatives could be certified for collective bargaining. The impact upon industrial relations and production resulting from such a bargaining pattern would undoubtedly work to the disadvantage of employees, employers, and the public.

As the American Potash Company asserted on this point in its case before the Board: "the more unions in the plant, the more contracts we must have, and opening of negotiations of these separate contracts gives rise to the uncertainty and apprehensions that inevitably accompany the negotiations."[49] Notwithstanding these considerations the N. L. R. B. established the *American Potash* doctrine declaring that "whatever may be lost in maximum industrial efficiency . . . is more than compensated for by the gain in industrial democracy and the freedom of employees to choose their unions and their own form of collective bargaining." In short, with respect to the solution of the craft representation controversy, the Board now seeks to promote industrial freedom rather than maximum industrial efficiency resulting from the establishment of wider industrial bargaining units.

Without deprecating the importance of the freedom of employees, including craftsmen, to select unions of their own choosing, the fact remains that the new Board's craft severance policy could lead to results inconsistent with sound labor relations, industrial peace, and efficient production. In many areas of social relationships it is necessary at times for personal freedom to be subordinated to group interests in order to achieve worthwhile objectives. Applying this principle to the craft workers' representation problem, the conclusion is not that these workers should never have the opportunity to break away from an industrial bargaining unit. Admittedly the *American Can* doctrine was ill-conceived because of its complete inflexibility. By the same token, the *American Potash* doctrine is just as rigid and automatic. Under the *American Can* principle, craft workers could never break away from the industrial unit. Under the new policy, craft

[48] National Planning Association, *Causes of Industrial Peace Under Collective Bargaining*, Case Study No. 1, (1948) p. xv.

[49] American Potash & Chemical Corporation, "Highlights of the Case for a Single Bargaining Unit," p. 4.

workers upon mere request can be severed from the more comprehensive unit regardless of considerations militating against this move. Both extreme approaches to the craft worker representation problem appear unwise.

Just as the *American Can* doctrine made the Board a prisoner of its own choice so does the *American Potash* doctrine accomplish the same objective. The new policy means that the Board will ignore all factors in resolving the craft unit controversy except the desire of skilled workers for separate representation. Traditional guides which the Board applied to the problem, such as the history of collective bargaining, the employer's organization and operation, the benefits obtained by the craft group in question from bargaining on an industrial basis, will no longer carry any weight.

The Board, of course, should not be an advocate of either craft or industrial unions. Its basic obligation under the Taft Hartley law is to establish a bargaining unit in each case which will "insure to employees the full benefit of their right to self organization and to collective bargaining, and otherwise to effectuate the policies of the Act."[50] At times, this obligation is best met by establishing an industrial unit while in other cases the craft unit would appear more appropriate. The craft worker representation feature of the Taft Hartley law does not dilute its basic bargaining unit instructions to the Board. The law merely says that the agency cannot deny craft groups the right to select their own bargaining agents on the sole basis of a prior unit determination. However, the language of the law and its legislative history endorses the proposition that the Board can deny craft severance elections on other valid grounds. The Board still has broad discretionary power to determine bargaining units. Instead of using this discretionary power to decide each craft severance case on its own merits, it had adopted a craft unit severance policy which is rigid, automatic, and mechanistic. It means that peaceful industrial relations and satisfactory bargaining relationships can be disrupted upon the mere request of a group or groups of craft employees. As Board Member Peterson said in his vigorous dissent in the *American Potash* case, "although the course taken today may simplify the task of this Board in resolving craft severance disputes, I think it does so only by jeopardizing if not sacrificing a substantial measure of the industrial stability attained by many employers and industries."

A craft severance policy which would be sounder than the *American Potash* doctrine would be one which balances the freedom of craft workers to choose their own bargaining representatives against the qualities of industrial peace, satisfactory labor relations, and maximum industrial efficiency. Under some conditions craft groups can be split from the industrial bargaining unit without sacrificing these qualities to any appreciable degree. When such circumstances prevail, and a group of craft workers desire separate representation, the Board should permit them to establish their own bargaining agents. Personal freedom would be advanced without grave injury being inflicted on good labor relations and industrial efficiency. When the price of craft severance comes too high in terms of production efficiency and stable industrial relations, however, the Board

[50] Section 9(b).

should deny the craft workers the opportunity to leave the industrial unit. This approach, however, cannot be taken just as long as the N. L. R. B. applies the automatic and inflexible *American Potash* doctrine to the craft severance problem.

CONCLUSIONS

With the chances for amending the Taft Hartley law by legislative action growing dimmer with each passing session of Congress, the role of the N. L. R. B. in shaping national labor policy becomes of greater significance. It appears increasingly clear that it is to the Board and not to the Congress that the nation must look for changes in the content of labor relations law. What policies this agency develops will determine many of the rights and obligations of the parties to the collective bargaining process.

Of course, there are limits to the powers of the N. L. R. B. There are duties that it must perform just as there are things that it cannot do under existing legislation. Between these poles there remains, however, a wide area for administrative decision. It is in this zone of discretion that the new Board has seen fit to upset or modify important policies established by its predecessors. How the Board will operate in this zone in the future will determine to an important degree the fate of collective bargaining in the United States. Its record during the past year gives real concern to those who feel that the encouragement of industrial peace within the framework of collective bargaining is sound national policy.

COMMUNICATIONS

A SUPPLEMENT TO DR. WITTE'S PAPER ON INSTITUTIONAL ECONOMICS

After reading Dr. Witte's splendid article on "Institutional Economics"[1] the writer wrote a letter to Dr. Witte, complimenting him on the excellence of his presentation, but indicating a desire to follow it up with additional observations and supplementary comments. Dr. Witte wrote back promptly, "By all odds, write the article."

Although this writer had John R. Commons as his Major Professor while working for the doctorate at Wisconsin, he has never considered himself an Institutional Economist. He has had too keen an interest in economic theory, and especially value theory, to qualify as an Institutionalist.

Knowing Dr. Witte as well as I do, and also knowing the emphasis placed on economic theory at Wisconsin, I feel confident that he fully recognizes the importance of fundamental economic theory. Yet, as I read Dr. Witte's paper it occurred to me that readers of his paper might infer that *experience*, a study of concrete economic problems, careful observation and statistics, might be all that is needed to make one a competent economist. Therein lies the urge to pen this note—not in any sense a rejoinder to Dr. Witte's article—but as a supplement.

This tendency on the part of contemporary Institutionalists to stress experience and the case method to the exclusion of theory and fundamental analysis is typically revealed by a paper recently presented by Clarence E. Ayres before a round-table at the American Economic Association. In that paper he said that Institutional Economics "does not abjure price data . . . But it does mean abandoning price theory."[2]

Now, it is the view of this writer that if Institutional Economists attempt to build their system of thought on experience alone, and abandon price theory, then the "Institutional School" will come to play a declining role in the history and development of economic science.

When the writers on the history of economic thought come to Institutional Economics, they invariably treat of Thorstein Veblen, Wesley C. Mitchell, and John R. Commons. What was it about these men which made them stand out above all other Institutional Economists? Personally, I have never been able to rate Veblen as a peer of Mitchell and Commons. Veblen was brilliant, a discriminating critic, a past-master in cynicism, ridicule and sarcasm—and most of the things he ridiculed were deserving of the venom from his pen. Yet, one looks in vain for correctives or cures for the maladies he described. He is all but devoid of a positive philosophy, or an integrated system of thought.

But Mitchell and Commons are different. They do wind up as great theorists

[1] "Institutional Economics as Seen by an Institutional Economist," by Edwin E. Witte, *Southern Economic Journal*, Oct., 1954, pp. 131–40.

[2] *Papers and Proceedings of the American Economic Association*, May, 1951, p. 50.

with a positive philosophy. For many, many years, John R. Commons lived, worked, and studied after the pattern described in Dr. Witte's paper. He learned through *experience*, by the case study method, the cases being supplied in real life, either in Wisconsin or in the federal government. Yet the time came when Commons felt the need for something deeper. And it so happens that Professor Commons was my Major Professor at the very time when he was doing this extra digging. I began to work with him in the summer of 1920 and was with him continuously till the Autumn of 1922.

It will be recalled that the economic crisis of 1920 broke in May. By June, some six or eight million men were unemployed. It was then that I heard Professor Commons say, "The greatest labor problem is unemployment, and the major cause of unemployment is the business cycle. So, I've got to study the nature and cause of this thing called the Business Cycle." He soon found that he could not understand business cycle theory until he had developed a comprehensive theory of value. In this way he pushed himself into his long and prodigious research, wherein he developed his "Volitional Theory of Value," and the ways and means of arriving at "Reasonable Value." These are developed in his two major theoretical works, *Legal Foundational of Capitalism*, (1924) and *Institutional Economics*, (1934). It was also during this period that he guided Alvin H. Hansen into his study of Business Cycle Theory, and the writer into his study of Value Theory and Business Cycles.

As a graduate student at Wisconsin, I took a great deal of work in economic theory, two courses with Richard T. Ely, two years with William A. Scott in the History of Economic Thought, and about twenty hours in seminars with Commons on Value and Valuation. Beyond question, John R. Commons, in his later years, became one of America's greatest economic theorists. Neither Ely nor Scott could touch him in that field.

I am told that Wesley C. Mitchell went through a similar change or metamorphosis. As a young man, his study of business cycles was almost wholly statistical. He seemed to feel that if statistical method were sufficiently perfected then it would supply an adequate basis for business forecasting, and if forecasting were accurate enough, the cycle would largely iron itself out. If the Bears could foresee depression soon enough, they could clip the boom. And if the Bulls could anticipate the recovery soon enough, they could ease the depression. Yet, as Mitchell grew older, his faith in statistics and forecasting began to wane, so he pushed himself deeper and deeper into economic theory. We learn from his later students at Columbia University that he gave one of the finest courses in the History of Economic Thought that has ever been given. The Great Institutionalist finally turned to theory.

As one wrestles with these great economists, Mitchell and Commons, he is led back to the philosophical debates in the times of Kant and Hegel. The central issue was, "How does one become wise?" Is it by *Experience* or by *Reason*? The answer is, by neither, but by both. The Great Hegel followed his vast researches into the realm of experience with the writing of a book on Logic and Pure Reason. And that is what made Hegel *Great*.

So, if one were to issue a word of counsel to the contemporary Institutionalist, it would be—"Never be content with the mastery of economics which can be gained only by experience." With experience as a foundation and background, push on as Commons and Mitchell did into fundamental philosophy. Develop a consistent system of thought, a unified theory of value, which will serve as a touchstone, or plumb line to bring experience and reason into a harmonious uniformity.

Louisiana State University H. L. McCracken

A NOTE ON ELASTICITY OF DEMAND

At the risk of appearing ungracious to a reviewer who said of our recently published book that it is "basically a good text," it is "well written," it "will win and keep the interest of the student," and it "gives an excellent treatment of how the basic forces of demand, supply, and price are designed to operate in a free enterprise society,"[1] I feel that it is necessary to point out that what is alleged to be an error "of a major nature," a "serious error badly in need of correction," is not an error at all, and such "confusion in regard to what constitutes elasticity equal to unity" as exists is in the mind of the reviewer and not in the book itself.

The reviewer objects to the statement that "if a very small change in price, say 1 per cent, calls forth an equal percentage change in quantity demanded, the elasticity of demand between those prices is said to be unity, or 1." He comments that "Now, that statement can be true or false, depending on how one uses percentages. Suppose that we start with a demand of 100 units at a price of $1.00. If price is raised 1 per cent to $1.01 and quantity demanded is lowered 1 per cent to 99 then elasticity of demand is not unity. For the formula for 'elasticity of demand equal to unity' is $PQ = C$ (Price times quantity equals a constant) but $100 \times 1.00 = 100$, whereas $101 \times .99 = .9999$." Sic! The moral is that when a self-styled institutionalist becomes involved with P's and Q's, he should be more careful with his decimal points. Of course, if total revenue varies even from $100 to $99.99, it is not quite constant. But we described the constant-total-revenue measure of unitary elasticity as a "somewhat crude but very useful rule of thumb" (p. 23). Our definition of elasticity is precisely equivalent to that of Boulding, whom the reviewer cites with approval, and Marshall, who also had some important things to say on this subject, and Samuelson, who is careful with decimal points. The only precise definition of point elasticity is, of course, given by the formula $e = dx/x \div dy/y$, and this is, we believe, made abundantly clear in our text.

But, the reviewer insists, "a much more fundamental error is introduced in connection with the diagram for Cournot's mineral springs." It appears that the error lies in the fact that we, like Cournot, assumed the demand curve to be linear, "but rarely, if ever in actual life, do we find straight line demand curves."

[1] H. L. McCracken, review of Clark Lee Allen, James M. Buchanan, and Marshall R. Colberg, *Prices, Income, and Public Policy* (New York: McGraw-Hill Book Co., 1954), *Southern Economic Journal* (January, 1955), pp. 350-352.

The reviewer's naive assumption here is that the rule that total revenue is at a maximum when elasticity of demand is equal to one holds only in the case of straight-line demand curves. In this he is, of course, clearly wrong, and his error must be corrected.

Reference is made to our illustration of a privately owned stadium whose owners wish to maximize total revenue; this will be done, we pointed out, by setting prices at the point where the elasticity of demand is one. But "the reviewer must insist that this would not necessarily be true unless the demand curve was a straight line." Suppose, he suggests, that at a price of $1.00 10,000 tickets could be sold. If at $2 the quantity demanded would be 5,000, the arc elasticity between prices of $1 and $2 would be one, and the total "take" would be $10,000 at either price. But, if the elasticity of demand between prices $2 and $4 were less than one, e.g., if at a price of $4 the number of seats which could be sold were 3,000, the total revenue at $4 would be greater than at a price where elasticity was equal to one.

But is total revenue maximized at $4? The reviewer does not ask this question, and the answer is that at some still higher price total revenue might be even greater. Presumably, at some very high price no seats could be sold at all; i.e., elasticity of demand would approach infinity in the very high price range. If the demand curve is non-linear but continuous, starting from a point where elasticity is less than one and moving upward to the range where elasticity is greater than one, it must pass through a point where elasticity is equal to one. This is the point of maximum total revenue. The reviewer has described a situation in which the total revenue curve has more than one maximum value and the demand curve has more than one point where the elasticity is equal to one. We avoided this complexity by considering the linear demand curve, which has but one such point. But whether the demand curve is linear or not, total revenue is maximized where the elasticity of demand is equal to one.[2] If the demand curve contains more than one point where elasticity is equal to unity, we must find the one which provides the greatest maximum on the total revenue curve; this is analogous to the profit-maximizing problem when marginal cost and marginal revenue curves intersect at more than one point. But the rule that total revenue is maximized when elasticity is equal to one holds whether the demand curve is a straight line or not.

There are, indeed, many "slippery points" in the analysis of the elasticity of demand, but in this case it was the reviewer who lost his footing. I suspect that I would find all of this amusing if it were a review of someone else's book.

Texas A & M College CLARK LEE ALLEN

[2] This follows from the familiar relationship

$$e = \frac{A}{A - M}$$

where e is elasticity, A is average revenue, and M is marginal revenue. Elasticity will equal one when $M = 0$, i.e., when total revenue is a maximum (or minimum). See, for example, Joan Robinson, *The Economics of Imperfect Competition* (London: Macmillan, 1942), p. 36.

REJOINDER

It is to be observed in the above "Note on Elasticity" that Professor Allen states that the "confusion in regard to what constitutes elasticity equal to unity" exists in the mind of the reviewer and not in the book. For this reason, it seems expedient to explore the *confusion* a bit further.

First, and foremost, it is obvious that the decimal point was misplaced, and should have been 99.99 instead of .9999. Of course, the *punch* line came when Mr. Allen said, "The moral is that when a self-styled institutionalist becomes involved with P's and Q's, he should be more careful with decimal points." If Professor Allen thinks McCracken is an Institutional Economist, or even a self-styled institutionalist, he is more confused about McCracken than he is with elasticity. But surely, institutionalism is irrelevant to the issue.

To return to the original issue, the authors did say that if price is raised 1 per cent and as a result quantity demanded is lowered 1 per cent, then elasticity of demand is equal to unity. My comment was that this statement can be true or false, depending on how one uses percentages. Had they used percentage change as Boulding and Samuelson did they would not have been in error. And in defense of their own technique, Mr. Allen says that the discrepancy between 100 and 99.99 is rather insignificant. And please note that the only fault they found with this illustration was that I had MISPLACED THE DECIMAL POINT! Furthermore, he says, "We described the constant-total-revenue measure of unitary elasticity as a 'somewhat crude but very useful rule-of-thumb.' " Now, the slight discrepancy between 100 and 99.99 was due solely to the small numbers used and not because their rule was reliable. Let us change the figures.

We will assume that a certain manufacturer was selling 1,000,000 units of his product at \$1.00 per unit. (PQ = \$1,000,000.) The manufacturer raised the price 50 per cent to \$1.50, and sales dropped 50 per cent to 500,000. (PQ = \$750,000.) Their crude rule-of-thumb method yields a discrepancy of only a quarter of a million dollars. Such a use of percentages is not *crude*, it is *dead wrong*. To avoid such an error, Boulding said that when we use percentage change, we must figure the per cent against either the larger base in both instances, or the smaller base in both instances. He chose the smaller.

Thus, Boulding would say that price rose 50 per cent from \$1.00 to \$1.50. But a 50 per cent drop in sales would be to 666,666+, in which case a drop in sales of 333,333+ would be 50 per cent of 666,666+, and not a drop of 50 per cent of 1,000,000. Using percentages in this way, 666,666+ times \$1.50 gives total revenue of \$1,000,000 and $PQ = C$ (a constant), as elasticity equal to unity requires. Boulding's treatment of percentage change does not give an approximate rule-of-thumb answer, but a precise and exact answer. In conformity with my "Review," I say again that there is a right way and a wrong way to figure percentage change when dealing with elasticity. Boulding and Samuelson used percentage change in the right way, and the ABC economists use the wrong way.

We now turn to the larger issue as to whether total revenue is at a maximum when price is set at the point where elasticity of demand is equal to unity. That is true for a straight line demand curve such as Cournot used, and for a very simple reason. All points on the curve upward and to the left of unity have an elasticity greater than unity. All points below unity have an elasticity less than unity. But the straight line demand curve tends to be the exception, rather than the rule. A very common demand curve is one which is relatively inelastic above the point of unity, and relatively elastic below the point of unity. In all such cases, a price at the point of unitary elasticity would be a price that yields a *minimum* of total revenue. For the standard rule of elasticity is that when total revenue increases as price increases, elasticity is less than unity, and when total revenue increases as price declines, elasticity is greater than unity. That is why it was possible to show that gate receipts at the stadium might be greater at $4.00 a ticket than when priced within the arc of unitary elasticity.

But Professor Allen raises the question, "Is total revenue maximized at $4.00?" Into that question I did not enter, nor did I need to, since I had established a point of greater revenue than the one where elasticity was equal to unity. In his "Note" he says that "presumably" there "*might*" be another price where elasticity was equal to unity that would yield greater revenue than a price of $4.00. In other words, Mr. Allen now admits that sometimes a price at unity yields maximum total revenue, and sometimes it does not. In making that admission, he conceded the entire point for which the Reviewer was contending.

We now wish to summarize the relation of unitary elasticity of demand to total revenue. There are only three possible conditions where "elasticity at a point" can be equal to unity. They are as follows:

Case I. It can be any point on a curve which has elasticity equal to unity throughout. In that case, there is no point of maximum total revenue, for total revenue is the same at all points.

Case II. We may have a demand curve where the segment of the curve upward and to the left of the point of unity has an elasticity less than unity, and that segment which is below and to the right of the point of unity has an elasticity greater than unity. In this case, a price at the point of unitary elasticity would be the price which would yield *minimum* total revenue.

Case III. We may have a demand curve where the segment above the point of unitary elasticity is relatively elastic, and the segment below the point is relatively inelastic. In this case, and only in this case, would maximum revenue be found at the point where elasticity of demand is equal to unity.

Thus we see that the contention of the ABC Economists that total revenue is at a maximum when elasticity of demand is equal to unity, is correct for only one of three possible situations. We can hardly champion a rule as infallible if it is valid for only one condition out of three.

As a concluding remark, I wish to say that I had no intention of offending the authors of a very good Text. But one of the functions of a "Reviewer" is to point out any error or misstatement so that correction can be made when the edition is revised. If the ABC Economists will study carefully both the Review

and this Rejoinder, I think they will see the need for a careful revision of their original treatment of elasticity of demand equal to unity.

Louisiana State University H. L. McCracken

A NOTE ON STABILITY CONDITIONS APPLIED TO PARTICULAR MARKETS

I

The movement to a new equilibrium position after a displacement of either demand or supply is assured under the usually presumed conditions where the demand function is negatively sloped and the supply function is positively sloped. In those cases where the supply function is also negatively sloped, only under certain assumptions will the movement of price and quantity result in a new equilibrium. These conditions differ for the Walrasian and Marshallian markets and are inherent in the type of supply curves they assumed. Walras deals with an exchange economy in which goods have already been produced. His supply curves are offer curves; they represent the willingness to exchange a commodity (which has use utility to its owners) for all other available commodities.[1] In essence these are the same as the reversed demand curves of Wicksteed. The Marshallian supply curve has a more objective basis. It represents actual costs at varying levels of production.

The conditions necessary to give stability in the market therefore vary for Walras and Marshall and have been outlined quite precisely in a lengthy footnote by Reder,[2] although it is not certain that Reder makes quite clear the essential difference in the nature of the supply curves postulated for the Walrasian and Marshallian markets.

Under the Walrasian and also under the Hicksian postulates, a displacement of equilibrium results first in a change of price with quantity varying thereafter. An initial displacement leading to an excess of quantity offered over quantity demanded will lower the immediate price. Any excess of supply on the market leads to a negative movement of price over time, and any excess of demand on the market leads to a positive movement of price over time. The adjustment of quantity must in a sense lag behind the movement of price.

The Walras-Hicks assumption might be called the price reaction. If, as under the usual conditions, demand is negatively sloped and supply positively sloped, it invariably leads to a new equilibrium after any displacement, and the market is stable. If the direction of the normal slope of either supply or demand is reversed, this is however, not necessarily true. For example, in those cases where the supply function is also downward sloping, stability is only assured if the

[1] Leon Walras, "Geometric Theory of the Determination of Prices," *Annals of the American Academy*, Vol. 3, p. 58, recognizes that this supply curve is appropriate only for the exchange problem. For the production problem, ". . . strictly speaking, the consideration of the expense of production determines not the *price* but the *quantity* of the products."

[2] Melvin Warren Reder, *Studies in the Theory of Welfare Economics* (New York: Columbia University Press, 1947), p. 112.

supply curve has the greater *absolute* slope, i.e., if demand is relatively more elastic. If the demand curve is, however, relatively more inelastic than supply (graphically if it cuts the supply curve from above), the market will be unstable under the price reaction assumption. Specifically, any shift in supply or demand will set up a movement *away* from equilibrium.

On the other hand, under the Marshallian postulate any shift in supply or demand results initially in a change in the quantity supplied. Any excess of demand will lead to an increase in quantity offered and any excess of supply will lead to a decrease in quantity offered with price adjusting thereafter.

In the normal case, where demand is negatively sloped and supply positively sloped, the quantity reaction, like the price reaction, always assures that the movement will be toward equilibrium. However, where the supply curve is downward sloping, the quantity reaction only assures stability if the demand curve is relatively less elastic than the supply curve. Marshall recognized, however, that under his assumption the market is unstable if the absolute slope of the supply curve is greater than the absolute slope of the demand curve, i.e., where demand is relatively more elastic than supply.[3]

These particular stability conditions have remained in general theoretical tools and have not been applied to the illumination of any actual situations.[4]

It is our purpose in this note to apply stability analysis to two common examples of declining supply functions. The first example is the declining supply function which is presumed to exist in many types of agriculture, and the second example is the long-run decreasing supply curve presupposed by the proponents of the infant industry tariff argument.

II

Certain types of agricultural production or the production behavior of some primitive groups may result in downward sloping supply curves. If, when the price of the commodity drops, the producers attempt to maintain their incomes by producing more, the resulting supply curve will be negatively sloped over some relevant range of time and place.[5]

Actually the type of short run supply curve that will exist under these conditions can be defined very closely. It is not likely that the producer will employ additional explicit inputs in a time of declining prices; he might, however, use more implicit inputs, i.e., his own time and labor. He is willing to sacrifice his leisure in an attempt to maintain his income. Under these conditions the supply curve will be a rectangular hyperbola—for at any price the farmer will work just hard enough to produce the quantity which will assure a constant total revenue.

[3] See Marshall's *Principles*, 8th ed., n. 1, p. 346, also appendix H, p. 806 and n. 1, *ibid.*

[4] That is, unless one wishes to take into consideration the reversal of the usual supply and demand positions implied in aggregate analysis, i.e., the consumption function, where stability is achieved by assuming the demand curve has a lesser slope than the supply function. That is, the consumption function has a slope less than 1.

[5] ". . . ; in fact, they, the farmers, often work harder as prices decline." Theodore W. Schultz, *Agriculture in an Unstable Economy* (New York: McGraw-Hill Book Co., 1945), p. 13.

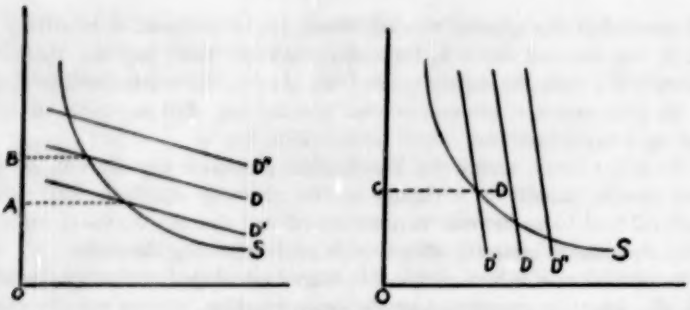

FIGURE 1

If explicit costs are not changed, this results in a constant net revenue. A supply curve with negative unit elasticity describes the sacrifice of lesiure for a constant income.[6]

A supply curve determined by a constant income constraint must always result in the price reaction of the Walras-Hicks assumption. An excess of demand will induce a price rise (and eventually a diminution of quantity), and a decrease of demand will induce an initial drop in price and a following increase in quantity offered. (With a supply curve of this nature, *any elastic* demand curve will give stability since the market reacts to any displacement with a shift in price, and any inelastic demand will be unstable.)

This is illustrated in Fig. 1A. If demand should fall from D to D' the initial price reaction will induce an increase in quantity produced until equilibrium is reached at the lower price, OA. An increase in demand to D'' will raise price and reduce the quantity offered until a new equilibrium is reached at a market clearing point with a higher price and a smaller quantity offered. It might be added at this point that this is probably just a short-run adjustment; the high income for little labor probably brings about an increase in capital or the entry of new producing units so there is eventually an outward shift of the whole supply function.

Nevertheless, our major point is that this short run equilibrium is not possible unless demand is elastic. If the demand for these farm products is inelastic as shown in Fig. 1B, any displacement of the market will result in dis-equilibrium. Of course, in a market which is out of equilibrium, almost anything is possible. Delivered price may not go to zero, because the final purchaser will have to pay distribution and harvesting costs. Nevertheless, in essence, the net price to the farmer may be zero if he decides his crop is not worth picking and packing, and it is therefore left to rot in the field.

A large part of the perennial farm problem has been ascribed to the inelasticity

[6] Actually the rectangular hyperbola is the limiting case in the sense that it represents the greatest sacrifice of leisure the producers are likely to make in order to maintain their incomes. Any sacrifice of leisure in an attempt to reduce income losses will result in a downward sloping curve. However, the rectangular hyperbola is a convenient illustrative case because it enables us to deal with either elastic or inelastic demand conditions and not concern ourselves with the relative elasticities of the supply and demand curves.

of demand which leads to a smaller total revenue for a large crop than for a smaller one. If however, a negatively sloped supply curve is introduced, the problem is compounded, and the inelastic demand for agricultural products may result in a short run instability of the market.

If supply curves based on a constant income objective exist in many agricultural markets, a theoretical justification can be found for interfering in the market with price supports. By good fortune, the support levels might just hit the equilibrium point and equate quantity supplied with quantity demanded—something which the free market in this case fails to do. This solution is illustrated in Fig. 1B, where the support price is represented by the broken line *CD*. The support price might, however, fail to equate quantity supplied with quantity demanded—but then the freely fluctuating market might also fail in this. It is difficult to make choices between amounts and varieties of distortion.

It should be recognized that in the long run there may be additional difficulties. A high support price might encourage new entries and a shift to the right of the whole supply function. (This might of course aggravate the problem.) It would seem that in this case supports might be better tied to an income notion rather than to a price level—for if income is held at some parity base, there will be less likelihood of expansion in the long run supply.

III

An interesting historical use of the concept of negatively inclined supply functions is involved in the argument for the "infant industry" protective tariff. Briefly restated, the argument holds that under proper conditions long-run decreasing cost domestic industries might be established which would eventually sell at prices lower than those of free imports. The tariff is needed to raise prices above some hypothetical "entry point" below which the domestic producers have perhaps neither the capital nor the foresight to attain the size at which the economies of scale begin to appear. However, once established, the domestic industry would expand along a decreasing-cost supply function to an output having the advantage of economies of scale and selling at a price lower than that paid for the imported goods.

The supply curve which is applicable to the infant industry case is, of course, Marshall's long-run declining supply curve. If demand exceeds supply, the quantity reaction is appropriate because the resultant profit leads to an expansion of the industry.[7]

The infant industry protectionist proponents ignored stability conditions; these would, of course, complicate the argument. When the Marshallian stability conditions are considered, it becomes obvious that a declining supply curve is

[7] Marshall, *Ibid.*, p. 459, n. 1, pp. 460 and 461, and Appendix H. In describing his long run declining supply curve Marshall disputes the notion that no equilibrium is possible in any case with such a curve. There is always a short-run equilibrium because marginal costs rise with output in the short run. It has been generally presumed that external economies (or some notion of a moderate historical improvement in technology) must furnish the major declining cost aspects of the curve if the industry is to remain competitive.

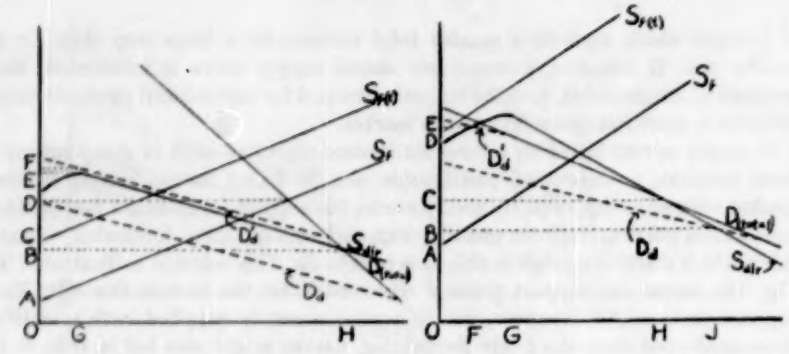

FIGURE 2

only a necessary condition to the hoped-for result of lower price and greater output; sufficient conditions necessitate that supply be more elastic than demand over the relevant range.

Two possible cases are illustrated in Figures 2A and 2B. The long-run domestic supply functions are drawn downward sloping. The rising sections at the left extremities of the supply curves indicate the assumed minimum capacity and price necessary to bring the domestic industry to the threshold of decreasing costs. The supply from foreign producers is assumed to have the usual upward slope. Total demand is shown by the solid demand curve D (total). By subtracting foreign supply from total demand, the demand for the product of the domestic industry can be derived and is shown as a broken line (D_d and D'_d). In Figure 2A the demand function has less absolute elasticity than the domestic supply and cuts the supply function from above. In this situation the domestic producers after entering the market may reach the anticipated stable long-run equilibrium. In 2B demand is relatively more elastic than supply and cuts the domestic supply function from below. In this case, what would otherwise be a stability problem is instead one of whether the tariff actually succeeds in its avowed purpose of establishing a low-cost domestic industry.

In Figure 2A, given the known or estimated demand, the long-run equilibrium price would be OB, with domestic production OH. The initial price without a tariff is OD and the foreign supply (S_f) is sufficient for the entire market. Price OE is assumed to be necessary to expand the domestic industry to the point of increasing returns. A tariff of AC shifting S_f to $S_f(t)$ will accomplish this, since it eliminates enough foreign supply at the price OF (greater than OE) to leave room for some amount OG of domestic production. (In 2A the domestic demand after the imposition of the tariff is now D'_d).

There is, however, excess demand for the product of the domestic industry and the market is not in long-run equilibrium at price OF. To the extent that the price exceeds OE there are greater than normal profits, causing expansion of the industry toward the anticipated long-run equilibrium at price OB and output OH. However, this is achieved only because demand is such that expansion beyond OG is profitable.

Figure 2B illustrates the situation where the demand (D_{total}) is relatively more elastic than supply and cuts the supply (S_{dlr}) from below. Neither tariff AD nor any other tariff can by itself induce the domestic industry to expand to output OG, where increasing returns to scale begin. The tariff raises the demand for domestic production from D_d to D'_d, and the market is in equilibrium in both the short-run and the long-run senses with price OE, domestic production OF and supplementary imports. Nevertheless this stunted domestic industry and high price is not the result the advocates of the tariff predict. However, the range beyond OG, where the supply price (S_{dlr}) declines, is an unstable one. The long-run behavior depicted by the Marshallian supply (cost) curve is such that producers would shun this area or back out of it if accidentally projected into it. Tariff or no, cost exceeds price between OF and OH, and the producers must make a bold "leap in the dark" to reach the expected break-even cost level OC.

Thus it might seem that an output subsidy or other such device is more likely than a tariff to successfully establish the industry. Furthermore, the retention of the tariff stops the industry short of the final output it is capable of achieving. Without a tariff the potential foreign supply will drive the price down toward OB and the output toward OJ, if the domestic industry had been expanded with some other device.

However, neither the equilibrium at price OC, quantity OH, nor the one at price OB, quantity OJ is stable. Expansion of the industry beyond OH (or OJ) is profitable. An eventual upturn in the supply curve or downturn in demand could bring stability to the market; in the meantime, however, it is quite likely that the intervening instability might lead to government intervention, a collusive price agreement, or monopolization of the industry.[8]

The introduction of stability conditions into the infant industry analysis reinforces the widely held suspicion that the protective tariff may not be the best policy measure to achieve the desired result. It will work as a starter to encourage the establishment of a domestic industry, but a final equilibrium (at a lower price and greater output) is reached only if demand is less elastic than the long-run supply. Otherwise the tariff may succeed only in establishing a high cost domestic industry with low output, sharing the market with the foreign supply, or it may succeed in mothering a trust.

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Michigan State University DONALD A. MOORE*

[8] J. E. Mead, *A Geometry of International Trade* (London: Geo. Allen & Unwin, 1952), p. 39, points out the instability of a trade equilibrium (short of complete specialization) when production in both countries is subject to decreasing costs. His is a special case of the more general one in which the demand curve cuts the supply from below. R. C. O. Mathews, "Reciprocal Demand and Increasing Returns," *Review of Economic Studies*, 1949–50, Vol. XVII (2), mentions the instability condition where the elasticity of demand is greater than the elasticity of the downward sloping supply curve. He is not, however, directly concerned with this problem in relationship to the infant industry argument.

* The authors are indebted to Professor Victor E. Smith, of Michigan State College, for constructive criticism of a draft of this note.

BOOK REVIEWS

The Aim and Structure of Physical Theory. By Pierre Duhem. Translated by Philip P. Wiener. Princeton, N. J.: Princeton University Press, 1954. Pp. 335. $6.00.

The appearance in English translation of a classic French volume (first published in 1906) on the structure and objectives of physical theory is an event of importance to all those who are concerned with issues of the philosophy of science. In economics, where a rigid, 19th century definition of the scope of the subject has nourished the misconception that the science is a methodological "sport," a continuing rehabilitation of its logical foundations may be aided by a volume which has served a similar function in natural science. The assumption that rehabilitation is a perennial task of economic science may suffice to justify comment on this work.

Duhem argues that the aim of theory is not explanation but rather the logical and symbolic representation of experimental laws. Like Ernst Mach, like econometricians and mathematical economists generally Duhem insists that "economy of thought" is essential to the human mind "which might not be able without such an artifice to store up the new wealth it acquires daily."

Unlike Mach, however, Duhem sees this logical ordering tending towards a natural classification of laws reflecting an ontological order. In this respect his opinion somewhat resembles that of those economists who envision the progress of economic science in terms of successive approximations to a "real" economic order. This view, periodically challenged in natural science by modern empiricists, exhibits considerable tenacity in economics—a phenomenon related to the ideological efficiency of the major theoretical systems. In the evolution of scientific thought, however, Duhem's contribution lies partly in the measured stride away from that "theory of approximations" which was dedicated by Mill as a cornerstone of economic science.

To Duhem, opposed to metaphysics in science at both the formal and factual levels, the mathematical structure of physical theory appeared necessary not only to enhance the predictive power of the theory, but also to guard against the metaphysical tendencies of late 19th century model builders. With delightful wit and a tinge of Gallic chauvinism he ridicules the "ample and weak" English mind and its propensity for mechanical model building. He finds nothing but minor illustrative value in the visions, a la Kelvin, of the ". . . strings which move around pulleys, which roll around drums, which go through pearl beads . . ." He wistfully observes: "We thought (in contemplating them) we were entering the tranquil and neatly ordered abode of reason, but we find ourselves in a factory."

Both his diagnosis of the metaphysical ailment and his remedy for it appear from the vantage point of today to be of greater relevance to social than to physical science. Moreover, while subsequent events have shown that he underestimated the fruitfulness of this variety of model for physics (the physical analogue), he overrated the physical theorist's talent for self-hypnosis. His

fundamental objections to model building are seen to rest finally on fears of the threat to scientific integrity implicit in the emotional appeal of mechanical models. There is little doubt that he would endorse much in the sophisticated equational systems of social and natural science today.

His argument cuts right as well as left. Small solace will be found here for those who interpret the adverse criticism of model building as necessarily favoring their particular endeavors. Some, for example, may become uncomfortable when the cutting edge of his logic moves close to that hyper-inductive school that has enshrined the defects of Mitchell's empiricism. Duhem's philosophy of science, bordering on the positivism of Mach and the conventionalism of Poincare (though identical with neither), implies criticism of a naive operationalism as well as of those who see in Newton's "hypotheses non fingo" the ideal mode of scientific procedure.

Duhem's contention that theories do not "explain" is at variance with much current opinion in physical science as well as in economics. In the former area, agreement has been facilitated by direct analysis of the explanation concept (Hempel, Oppenheim, Feigl, Nagel, etc.). Cannot the results of analysis by philosophers of science be applied systematically and fruitfully to economics? What is and what has been the "content" of the explanation concept in economics? A deliberate reopening of the question of the logic of our accounts may facilitate achievement of a more meaningful accord than at present obtains. Current unity on the issue rests, one suspects, principally on the circumstance that critical eyes and analytical efforts, with few exceptions, are directed to other fronts.

For those who might fear that their limited knowledge of physical theory will block an understanding of the author's argument, reassurance may be freely offered. Duhem writes lucidly and penetratingly of matters of rather universal scientific import. His comments upon such matters as the utility of mathematical deduction in physical theory, the character of law in science, the testing process, the criteria governing the choice of theoretical postulates, etc., have in many instances become classic statements and therefore demand careful consideration. Moreover, his writings have stimulated a generation of researchers in the philosophy of science. Economists who ponder these and related problems may likewise become his intellectual beneficiaries.

New York University JAMES F. BECKER

Theory of Economic Dynamics: An Essay on Cyclical and Long-Run Changes in Capitalist Economy. By M. Kalecki. New York: Rinehart & Co., 1954. Pp. 178. $3.75.

Mr. Kalecki has given us, in the volume under review, a restatement of his original and rather unorthodox views on economic dynamics. While the reader will no doubt notice strong similarities between this book and the author's earlier *Essays in the Theory of Economic Fluctuations* and his *Studies in Economic Dynamics*, nevertheless this latest book has a sufficiently novel cast to be of great interest.

Several rather unexpected topics appear in the book, for example, Kalecki's

concept of cost-determined and demand-determined prices and his equally original definition of the degree of monopoly. Similarly, proportionately more attention is given to the distribution of national income and the determination of certain components of national income than we have come to expect in a field that deals largely with economic aggregates. But the more usual subjects, the business cycle and secular changes treated by means of aggregates, are examined by the author's very interesting methods.

A few of the many points of special interest can be noted. Kalecki emphasizes the role of monopoly as a dynamic determinant in the capitalist economy. To the reviewer it appears that there is a neglected area here that should be explored even more thoroughly, but Kalecki has made an important beginning. An additional point of interest is Kalecki's treatment of the acceleration principle. The accelerator appears only as one of four determinants of investment. Further, Kalecki believes that, considered in isolation, the acceleration principle is unrealistic because it relies only on the rate of change of economic activity, not on the level of economic activity. No mention is made of the multiplier.

Perhaps the most interesting part of the book is the portion that deals with the business cycle and shocks. Kalecki records the results of experiments with damped cycles subjected to erratic shocks. In one case random shocks from a rectangular distribution were applied to damped cycles with unrealistic results. In a second case normally distributed random shocks were applied to damped cycles with much more satisfactory results. Unfortunately, the rationale of these different results is not spelled out at all by the author; indeed he gives it very scanty notice.

The criticism of insufficient explanation of the material covered can also be leveled against the sections of the book that deal with problems of economic growth. Many suggestive and interesting points are made, but the author frequently does not give a conclusive explanation.

Although the book is primarily concerned with the theory of economic dynamics, numerous illustrations using numerical data are employed by the author. The author seems to regard these as merely illustrations and not as tests of the theories. In the Foreward he excuses his use of the method of least squares on the ground that the illustrations are only illustrations. Probably, it would have been desirable for the author to discuss the testing aspects even though his method yielded only first approximations.

Basically, Kalecki's approach is mathematical, although he does not strive for a rigorous presentation. He uses only elementary mathematics. Anyone with a mastery of the fundamentals of algebraic manipulation should be able to read the book without undue difficulty.

University of North Carolina R. W. Pfouts

The Multiplier Theory. By Hugo Hegeland. Lund, Sweden: C. W. K. Gleerup, 1954. Pp. x, 261.

This book undertakes to criticize and evaluate the multiplier concept from a methodological viewpoint. Because of the emphasis on fundamental ideas,

their are only brief notices of the recent technical elaborations of the multiplier, such as the foreign trade multiplier and the matrix multiplier. On the other hand, an initial chapter is devoted to foreshadowing the major developments at Cambridge, although the material has little interest and occupies a modest place in the book. Most attention is devoted to the suggestions of Kahn and Keynes. The discussion leans heavily on such early critics as Haberler, Angell and Neisser. The general viewpoint is one of (uneven) hostility to aggregation.

Sometimes the discussion approaches a polemical form, especially when it brings into question the use of multiplier theory to defend deficit spending on public works in time of depression. It was, of course, the purpose of Kahn in his brilliant article (*Economic Journal*, 1931) to promote deficit spending. Kahn, as well as, even earlier, Keynes was interested in refuting other eminent economists who opposed a deficit spending program for the relief of unemployment, either because the money raised by government through bond sales would be at the expense of private investment or else because the spending of newly created bank money would be inflationary. So far as I am able to see, Kahn gave quite the proper answers to these caveats, the same answers one acquainted with the subsequent Keynesian literature might give today. Surely, his article is one of the masterpieces of economic literature, difficult as it may be today for us to appreciate the degree of change in economic thought which followed it and which it partially inspired. The ideas adumbrated in Kahn's article must have furnished much of the foundations for Keynes' *General Theory*, which transfers them, indeed, to a broader stage, but which perhaps is not so much more impressive, viewed from today. However, we must allow that Keynes had probably contributed to the formation of the ideas presented by Kahn in his article.

The general tenor of Hegeland's criticism is that what happens depends on many unmentioned (unspecifiable?) things, to wit, who receives the money in the first place, second place, etc., on the state of business confidence, on the impact of the spending on private investment in many ways, and so on. The objections do not seem very novel, though they undoubtedly have some merit. They were, to a surprising degree, taken account of by Kahn himself. In addition, there are concessions to the quantity theory of money which do not seem to clarify many issues. There is also an extended discussion on whether the multiplier is intended to be instantaneous or asymptotic, dynamic or static. Finally, I believe that I recognize a goodly amount of plain loose talk.

Duke University LIONEL W. MCKENZIE

Business and Economic Forecasting. Report of the Committee on Economic Policy. Washington, D. C.: Chamber of Commerce of the United States, 1954. Pp. iv, 30. Paper, 50¢.

Persons interested in business and economic forecasting from the instructional standpoint, from the point of view of making actual business policy decisions as well as economists engaged in actual forecasting will find this publication worthy of reading. The Committee has done a good job of presenting in a brief

and concise form the importance of forecasting along with an examination of the various approaches to the problem.

The publication begins with an enumeration of the issues involved in business policy decisions. Among these are Plant expansion, Inventory accumulation vs reduction, Financial policy (liquidity, working capital, debt vs equity), Re-equipment and replacements. Following this appears a brief discussion of "Fallibility of Forecasting," "Seasonality of Forecast," and the difficulties in interpreting "What the Forecaster is talking about," this latter resulting mainly from the use of imprecise terminology and time intervals on the part of the forecaster.

The remaining part of the publication is devoted to a discussion of the various approaches to economic and business forecasting. Six specific approaches are presented by the Committee. For each approach the procedure is pointed out along with the various limitations. The first and more recent of these approaches is that of economic models. This method involves "extensive quantitative analysis of business and economic trends of the past. Elaborate equations may be formulated and innumerable variables may be fed into the structure and rather precise forecasts emerge." A second method and one most favored is that of "sector analysis." Under this approach the economy is broken up into several sectors and each sector analyzed. Then a summary of the various sectors is made for the economy as a whole.

Other methods discussed in the bulletin consist of the use of barometers or signals (usually time series), money and credit, simple trend projection and appraising expectations of people such as purchasing agents, salesmen, etc.

Clemson College B. J. Todd

The Economist in the Twentieth Century and Other Lectures in Political Economy. By Lionel Robbins. London: Macmillan and Co. and New York: St. Martin's Press, 1954. Pp viii, 225. $3.50.

This little book consists of a very interesting collection of more or less interrelated lectures, virtually all of which have been published previously either in whole or in part.

The first lecture, from which the book obtains its title, is of broader scope than the other lectures, and in it the author presents his views on the position of economists in the modern world and that of economics in the social science hierarchy. It was delivered before the students and faculty of the London School of Economics on the 53rd anniversary of the foundation of the School, and was published previously in *Economica*, May, 1949. This lecture describes in a very fascinating manner yet with complete objectivity the present position, the role, and the limitations of economics in the twentieth century, and in the reviewer's opinion should be required reading for all graduate students in economics.

The second lecture, "Full Employment as an Objective, discusses four objections to Beveridge's full employment objectives, i.e., "more vacant jobs than persons unemployed," and presents a counter proposal, namely, "as many jobs

as workers provided they are willing to go to them at wage rates not increasing more rapidly than productivity," which is much less objectionable.

The next six lectures, all dealing with matters of economic, financial, and commercial policy as it relates to problems of achieving simultaneously internal stability and international equilibrium, were delivered originally at the Instituto Brazileiro de Economia and published previously in the *Revista Brasileira de Economia*.

This series of lectures discuss consecutively the problems of The Dollar Shortage, The Control of Inflation, The Mechanism of International Payments: Fixed and Free Exchange Rates, The Classical Theory of Commercial Policy, Commercial Policy in the Present Age, and finally International Financial Reconstruction.

The dollar shortage is explained in terms of the inflationary finance of the deficit countries, which in turn has led to trade restrictions against U. S. A. While no panacea is suggested or intended, the solution offered consists of first controlling internal inflation by appropriate monetary and fiscal policies, and then gradually achieving international equilibrium and stability by effectuating the classical theory of commercial policy, which the author reaffirms, via the multilateral, "most-favored nation" trade concession approach. In this connection the work of G. A. T. T. on the beginning of an international commercial code is commended, although much remains to be done.

World wide convertibility of currencies is necessary, it is argued, but first overvalued exchange rates must be corrected and strangling trade restrictions eliminated. Also adequate monetary reserves will be required and this may require revamping the International Monetary Fund.

The book concludes with a lecture on The Atlantic Community and an Annex on Economic Policy in War-time.

The Economist in the Twentieth Century is a very delightful and interesting book, and it represents a significant addition to the economic literature on post-war international economic problems and their solution.

University of Houston ERVIN K. ZINGLER

Private Enterprise and Public Policy. By Melvin Anshen and Francis D. Wormuth. New York: Macmillan Company, 1954. Pp. xiv, 742. $6.75.

"Public regulation" would have been a better phrase than "public policy" in the title of this book. Discussions of "policy" ordinarily require a systematic survey of the problems which shape the policy. Economists of course are accustomed to a treatment which demarcates problem areas according to some features of economic structure or behavior, and then discusses the policies that have been and might be applied to each one. From this point of view the organization of the book is chaotic. Every area in which public policy may impinge on the private economy is included in its panoramic presentation, but the economic analysis is rudimentary and fragmented. A single chapter (Chapter 8) contains sections on patents, copyrights, and trademarks; federal loans and insurance; the Federal Reserve System; social security; agricultural price sup-

ports; the post office; export bounties; and public lands. Regulation of finance and banking is encountered in this chapter, again in Chapter 10, and again in Chapter 15. Public utility regulation turns up in Chapters 7, 8, and 12 (a whole chapter this time, on the power industry). The reader may often find himself trying to piece together a disconnected and partly repetitive analysis of some problem by skipping hundreds of intervening pages that deal with other subjects. Contrary to what most economists would regard as simple prudence, the authors undertake in a single volume a general discussion of macro-economic problems—depression, monetary controls, inflation—with a survey of the more conventional regulatory-policy questions like anti-trust and public utility regulation.

It is when we consider the book from the point of view of political science that its organization becomes clear. Many of the chapter headings explicitly emphasize that the problems under discussion are grouped according to the administrative, legal, or procedural categories which this or that aspect of them may fall into. This organizational structure is marred here and there by a discussion which really does attempt to deal with the economics of some problem. The best feature of the book, combining both lines of approach, is a number of case studies in Part Four (notably the studies of aluminum plant disposal and bituminous coal), which are well worth the attention of students of industrial organization and public policy.

Whether this text will meet the requirements of courses in "Government and Business" taught in political science departments, this reviewer is not qualified to say. (The book is so used at his own institution.) It will certainly not give students in such courses an adequate or systematic grounding in the economic problems that public policy deals with, and it is doubtful whether teachers of economics will find it usable as a textbook. Nevertheless the book contains information on laws, procedures, rules, and organizations relating to public regulation which is encyclopedic in scope, and economists will probably find it valuable for reference purposes.

Vanderbilt University JAMES W. MCKIE

Managing the Federal Debt. A Statement on National Policy by the Research and Policy Committee of the Committee for Economic Development. New York. 1954. Pp. 42.

The Committee for Economic Development has added to its lengthening list of Statements on National Policy a recommendation for managing the present huge federal debt.

It is particularly concerned with the large proportion of the debt that is short term and the fact that its average maturity is continually becoming shorter. The Committee states that at the end of 1946 the average time until maturity of the privately owned and marketable part of the debt was 10¾ years, but that by the end of 1953 it was only about 5½ years. It suggests that a careful, gradual lengthening of the average maturity is desirable.

The Committee's purpose is to suggest ways by which the debt can be made to contribute as much as possible "to stability of employment and production at a high and rising level without inflation."

Its policy statement, however, says practically nothing of the potential for inflation in a large national debt that has become to such a great extent short term. In this connection it merely declares that "The short-term debt position is not explosive"—an assertion with which many economists would flatly disagree.

In fact, the Committee minimizes the inflation potential of the present debt situation by ignoring the essentially short-term nature of the $58 billion in Savings Bonds. It excludes them entirely from what it considers short-term debt merely by classifying them as "Nonmarketable." Actually, however, most of the Savings Bonds now outstanding are payable either on demand or after one month's notice.

The Committee also minimizes the total amount of the debt. It excludes from consideration the $48 billion of federal obligations "owned by the government itself." Although it acknowledges in a footnote that this amount is held in trust accounts for such purposes as social security, unemployment compensation, and veterans' life insurance, it apparently does not recognize those accounts as being obligations of the government—in the role of trustee—to make payment at some time in the future. What kind of a trustee would place its own evidences of debt in the accounts of its clients and not recognize a commitment to pay them!

Apparently the Committee is unaware that the Federal Government has been going continually deeper into debt. At the very outset of its Policy Statement it declares without qualification that "Over the preceding seven years [to the end of 1953] the debt had declined by $1.7 billion." That astonishing statement is followed by the comment: "At this rate of reduction by the year 2884 we would have no federal debt."

How this amount of debt reduction was determined is not shown. The fact is, that in the seven-year period referred to, the total gross debt increased by $15.8 billion, and the net debt (total gross debt minus the balance in the Treasury's general fund) increased by $14.7 billion. Have the Committee's statisticians made a serious error here? Surely it is not the Committee's purpose, in a "Statement on National Policy," to conceal by some statistical legerdemain the incontrovertible fact that the federal debt has increased substantially since 1946?

It is regrettable that so widely circulated a statement by so well known an organization as the Committee for Economic Development—dealing with a subject vitally important to our economy—fails to come to grips with the problem of managing the federal debt, ignores its salient features, and passes over the most pertinent facts.

New York University ROBERT T. PATTERSON

Fiscal Policy. By James H. Maxwell. New York: Henry Holt and Company, 1955. Pp. vi, 218. $2.90.

Professor Maxwell has approached the study of fiscal policy through its techniques and institutional setting.[1] His book is intended to provide an exposition

[1] "Instruments for economic stabilization have to be examined in relation to their institutional framework." See preface in Kenyon E. Poole, *Fiscal Policies and the American Economy* (New York: Prentice-Hall, 1951).

of both theory and practice of fiscal policy in the United States. The need for such a synthesis is clear enough when it is realized that, in less than thirty years, there has been a major shift in economic opinion relative to "sound" government finance—a shift which is "so complete as to be startling." Though laying no claim to an original contribution to theory, Professor Maxwell has given us a highly useful analysis which obviously bears the stamp of his own interpretation.

The author begins with a survey of the theories of government functions and points out that, under the assumptions of the classical writers on public finance, fiscal policy was unnecessary. In assuming full employment the Classicists neglected the harmful effects of cyclical variations and overlooked the impact of government through the creation of purchasing power. What is the criterion of the proper agenda of government today? In spite of the existence of a penumbra between the public and private sphere, the author would apply the test of collective versus individual benefits. It is this test that should determine the basis of governmental action, even though the boundary between the public and private economy is not precise and must be determined by political decision. In the main government should undertake those functions which cannot or will not be done by private enterprise. Fiscal policy, used to secure economic stabilization through the use of government expenditure and revenue, is one of these.

Monetary policy should go hand-in-hand with fiscal measures. While it has not, within itself, proved effective in preventing recessions or promoting recovery, when coordinated with fiscal policy it becomes a highly useful means of control. Monetary policy is more significant in prosperity, fiscal policy in depression. Another device for economic stabilization is debt management, the major aspects of which are the "maturity structure" and the reinforcement of fiscal policy through a deficit or surplus. Finally there are direct controls which are essential in wartime, but which are incompatible with a free enterprise economy in peace time.

Professor Maxwell is fully aware of the difficulties that must be overcome in the implementation of any fiscal policy program. He makes no effort to disguise, as with a magic wand, the problems that are inherent in our tri-partite system of government, and especially the relations of Congress to the executive branch. He makes no assumption in respect to secular stagnation, but limits his analysis to countercyclical movements in which the main objective is to keep unemployment within "modest bounds." While recognizing the defects of an annually balanced budget, he finds the concept of a cyclical balance elusive and ill adapted to our political and administrative machinery. There are technical problems in a workable definition of full employment, but it is generally accepted now that depression unemployment is a responsibility of the federal government. In applying measures to counteract swings in the cycle, however, time is of the essence and the art of forecasting is one of the most baffling of all things. The causes of a particular boom or slump can never be fully known and the multiplier and acceleration effects of a given policy "must be guesses." Nevertheless in a recession is it not better to exercise a choice of risks and apply fiscal policy—even if tardily —with vigor?

Greater stability may be achieved through "built-in" variations in government expenditure and revenue. Deficits in depression and surpluses in prosperity will result automatically from changes in gross national product and perhaps without the necessity of changes in tax rates by congressional action. The effectiveness of built-in or automatic flexibility obviously will depend upon the tax structure and programs of government expenditure. Other stabilizing factors are agricultural price supports, social security and public works.

In all of this Professor Maxwell shows keen insight. He has delved into the problems as well as the virtues of fiscal policy. He has a pleasing and forceful style, a balanced presentation, a wide knowledge of the literature of his subject. He has faith in the ultimate efficacy of fiscal policy and believes that, without undue sacrifice to our democratic government, it is possible to have both growth and stability in our economic system.

University of Virginia TIPTON R. SNAVELY

Approaches to Economic Development. By Norman S. Buchanan and Howard S. Ellis. New York: Twentieth Century Fund, 1955. Pp. xiv, 494. $5.00.

As a competent survey of a known problem, Professors Buchanan and Ellis have produced a volume that can profitably be used as an introduction to the topic of economic development or as a convenient catalogue to the voluminous specialized literature in this field. As regards the former, the authors have collated and refined the existing thought on such topics as capital accumulation and allocation, methods of financing development, the role of the state in economic development, and the underdeveloped country in international trade and industrial fluctuations. With respect to the latter, the authors' references furnish a detailed listing of publications prior to 1954.

Most economists will find two aspects of the authors' approach to economic development refreshing. In the first place, economic development is defined in terms of industrial and agricultural performance and material well-being, as evidenced by numerous statistical indexes. Admittedly, data for many countries is scarce and inaccurate, and index numbers as such are subject to criticism; nevertheless, a quantitative definition appeals to one as being more rigorous than the many "socio-cultural" generalizations that stud the literature of this field.

Secondly, the authors acknowledge the importance of social, political, and cultural influences in underdeveloped areas, but they restrict their study to economic factors and influences. Thus, in the first half of the book, attention is focused upon problems that are within the purview of the economist; and in the last half, the analytical tools unique to economics are utilized in studying them. From the latter part, however, the economic theorist is likely to conclude that, for the present, further work on underdeveloped areas lies in the province of descriptive economics.

One question that constantly confronts Professors Buchanan and Ellis is: can economic development be achieved in a private enterprise economy? Assuming that an unlimited flow of grants and loans is not forthcoming from U. S. and international agencies, economic development is contingent upon capital ac-

cumulation within the underdeveloped area. Capital accumulation entails saving and investment, or, in other words, a propensity to consume somewhat less than unity and the performance of entrepreneurial functions. But the typical situation in underdeveloped areas is a high rate of consumption and almost total absence of an entrepreneurial (or even managerial) class. Furthermore, since the absolute level of consumption is so low, voluntary savings are not likely to be forthcoming.

Against this rather gloomy background, the prospect for development within the framework of a private enterprise economy is not too pleasant. However, the authors also educe several factors that militate against Marxian development, such as emphasis upon large projects and rapid industrialization, whereas programs that utilize capital-saving, rather than labor-saving, improvements are more productive.

The authors suggest that the state, by use of the limited loans and grants that are available, make the necessary "social overhead" investments (*e.g.*, transportation, utilities, public health, and education). With these basic facilities, if a favorable economic milieu is provided (*i.e.*, stable government with a private-enterprise orientation), there is reason to believe that the savings of wealthier citizens, supplemented by a margin of foreign private investment, will provide adequate capital for gradual, but well founded, development.

The book is scholarly, and each section is well written; however, the sections are not integrated. Part I ("An Analytical View of the Problem") is valuable primarily for the definition contained in the first two chapters. The reader who is at all familiar with economic history may well omit Part II, a one hundred and fifty page survey of "Economic Development as Recorded History." Part III ("Achieving Development in the Contemporary World") contains the crux of the work. In itself, it is a well integrated, theoretical statement of the problems of economic development. Readers who have studied in this field, or those who are not interested in the empirical and historical aspects of economic development, can profitably confine their attention to this section alone.

University of North Carolina C. E. Ferguson

Constructive Liberalism: The Role of the State in Economic Development in Georgia to 1860. By Milton S. Heath. Cambridge: Harvard University Press, 1954. Pp. xiv, 448. $7.50.

This is the final volume in a series of four studies of the relationship between state government economic policy and economic development prior to the Civil War. Planned as a unit by Harvard's Committee on Research in Economic History, and given a certain amount of general guidance by this same group, these analyses are especially noteworthy for the high degree of individuality their authors have embodied in them while still adhering to the projected problem. Thus although Professor Heath's individuality shows up in a number of ways, perhaps the most distinctive feature of his volume is the greater thoroughness with which he examines early economic policy in Georgia than went into the studies of Massachusetts, Pennsylvania, and Missouri.

The title given this study derives from the author's desire to give greater

precision to his problem. Discarding the more popular if overworked distinction between liberalism and conservatism (or, in these times, between conservatism and radicalism), a line of demarcation is drawn instead between constructive liberalism and laissez-faire liberalism. "This positive conception of liberal policy, which contemplates individual freedom and group action as complementary, and the former as the object of the latter, will be termed constructive liberalism in this study, in order to distinguish it from laissez-faire liberalism which has advocated as the guiding hand of public policy almost exclusively the constructive role of the individual" (p. 5). Professor Heath's conception of the early evolution of public policy in Georgia is a continuous struggle for ascendancy between these two contrasting notions of liberalism.

It is this philosophical presupposition which, more than any other single thing, gives form to this presentation. Here lies the justification for analyzing policy formulation as a resultant of complex interrelations between various social forces. Here too is an ample basis for recognizing that the social forces behind the emergence of particular institutions do not consist exclusively either of high-minded ideals or self-seeking interest. Rather men both idealize (rationalize) their interests and seek goals consistent with received ideals in such a way that it is difficult to distinguish between these two things.

The way in which this approach is utilized to illuminate various aspects of policy formulation is particularly well illustrated in the chapters on land policy. Here Georgia was confronted with a much more acute problem than almost any other state—a problem not strikingly different from that faced by the federal government on this same issue. Georgia's earliest solution was "a policy of first come first served," the so-called headright system. After a quarter of a century of experience with this solution, however, an almost complete about-face was effected, and a lottery system instituted instead that gave a reasonably equal opportunity to all comers.

Numerous elements went into both the original policy and its abandonment, and it is the combination of these elements operative at different points in time on which this discussion largely centers. The influence of British practice, "strong clashes of economic interest . . . between tidewater and interior and between large planters and small farmers," "divergent postulates of policy . . . (concerning) the nature and aims of free enterprise and how best they might be secured and maintained," the special claims of veteran's groups, public reaction to speculative abuses such as the Yazoo episode, the relative growth of upstate population and influence relative to downstate—all of these factors entered into the parallelogram of forces out of which Georgia's land policy was carved.

In a similarly painstaking (tedious would be a better word from the standpoint of those whose patience with details is more easily exhausted than the author's) fashion Professor Heath examines the sources and dynamics of banking policy, the state's relationship to transportation development, public action relative to the rise of the corporation in Georgia, education and labor policies, the state's regulatory activities, and fiscal policy. Throughout, the conclusions of this work further document the concensus already arrived at in the companion volumes

of this series: economic policy prior to 1860 exhibited few traces of the laissez faire which came to dominate the American scene after the Civil War.

It is perhaps not necessary to warn the reader that this volume does not purport to be an economic history of Georgia for the period covered, and there are in consequence many points of general interests that remain in the background. In this category would be placed the socio-economic conditions in Georgia during "the critical period" and the implications of the slavery controversy for the economic life of that state. Such gaps, however, are only another indication of the care taken to keep a difficult task within the bounds initially established. But on the other hand there are a number of by-products of this study which will add considerable grist for the mill of the economic historian as such. One of these is the conclusion that Georgia's land policy was a stage in the development of the land policy ultimately arrived at by the federal government. Another is the documentation given the proposition that the giving of banking powers to railroads did not, in Georgia, have any kinship with the "wildcat banking" characteristic of so much of this period. And even the few pages devoted to the controversy between Georgia's banks and the Second Bank of the United States may contribute food for thought to students of that ill-fated institution.

In summary, this volume is an outstanding addition to the available literature on America's early economic development. Steadily, but all too slowly, the emphasis in this field is abandoning the mere enumeration of people and places as these interact in the form of historical events. Professor Heath's work will perhaps contribute to an acceleration of the trend toward a more analytical approach.

University of Georgia HOWARD R. SMITH

People of Plenty: Economic Abundance and the American Character. By David M. Potter. Chicago: University of Chicago Press, 1954. Pp. xxvi, 219. $3.50.

Professor Potter, a distinguished Historian, in this interesting book has achieved a "tour de force" in cross disciplinary comment. Only his sightly pedantic style has marred an effort which in all other respects would make the average discipline bound social scientist envious. Professor Potter has pinpointed American national character on the singular fact of the abundance of consumable goods which our society has attained.

In his first section, Professor Potter examines and then rejects the traditional historians' conception of national character based on semifictional characterizations. He has turned to the writings of the behavioral scientists, particularly Margaret Meade, David Riesman, and Karen Horney, as giving a more realistic appraisal of the determinant of culture and its effect on the individual. Combining their analyses of the inner and outer social and economic pressures on the individual, Potter finds that the unique factor in American society is the economic abundance and its pressure on the individual to maximize his social position through increasing his consumption.

Developing his concept of the effect of economic abundance on American character, Professor Potter has written a series of relatively unrelated topical essays

in which he traces this abundance and its relationship to a number of diverse subjects. He points out that despite the overwhelming factor of American abundance we have failed in our mission to the rest of the world in convincing them that our political institutions have aided us in attaining our present position. As a result, we have succeeded in stimulating only envy but without political emulation. Among the several essays, the two chapters on the unusual American institutions of "hucksterism" and the poor over-coddled American baby are particularly good and well worth the price of admission.

Professor Potter's book should be thrust into the hands of all welfare economists who in urging us up the steep utility slope of maximum welfare positions based on per capita real income measurements seem to have forgotten other values. Maximizing individual economic welfare does not lead necessarily to maximum social welfare positions. This, I believe, is the point so clearly made in this stimulating book.

This book is another important contribution to the ever widening field of cross disciplinary work leading to a true social science. It is "must" reading for all economic historians and those who question the "axioms" of political economy. Since the scope of this book is encyclopedic, Professor Potter is unable to adequately cover all of his points. This, I hope, will stimulate further work in the field.

University of Georgia ROBERT R. DINCE, JR.

The Location of Agricultural Production. By Edgar S. Dunn, Jr. Gainesville, Florida: University of Florida Press, 1954. Pp. vii, 115. $3.50.

The idea of formulating a general equilibrium theory on the conceptual basis of a distance-rental cost serves as the central objective of this book. Professor Dunn accomplishes this main purpose, thus carrying Hicksian general equilbrium analysis one step forward. His end presentation makes up a neat little packet which should be read not only by those interested in agricultural economics, or location theory, but by those interested in general equilibrium theory.

The place of this book in economic literature may be noted most briefly by suggesting von Thünen and Isard as its main sources of inspiration. One finds, in the text, the ring system explanation of agricultural locations carried on to great depths by the recent ideas on the geographic distribution of inputs and outputs. Rent is expressed as a function of distance, not output, with space becoming an explicit part of economic theory. In turn, the ring system design is defined more or less sharply, depending upon the linearity of the industry rent function.

The system of economic relations that is described in the text is nothing more nor less than that which is indicated by its title. The book offers explanations of the location of agricultural production, gaining its strength in a smooth development of this objective, while, at the same time, being subject to the associated disadvantage that follows from such restricted view of spatial relations. Basic to the plan of analysis of agricultural locations is the hypothesis of a point formed market center (or market centers). Derivation of the distribution

of agricultural production around the central consumptive point (or points) yields a special case of space relations which resembles the traditional temporal economic theory more than would the equilibrium system that follows from an examination of manufacturing plant location. Bear in mind that this contention is not formed to serve as a criticism of the text in question; rather, its design is to emphasize the fact that Dunn's development of Hicksian general equilibrium theory yields still a special case, and not a fully general one.

In the real world, rent or transportation is a cost factor of production. In the presentation of the text, space forms a part of the equilibrium system through the inclusion of such factor. By conceiving of a point formed demand, this distance-rental aspect becomes the only essential element of change from traditional general equilibrium analysis. And, though this needed transition is, in itself, a not too drastic innovation to explain, the way in which it is handled in the text is quite masterful indeed.

After offering the space equilibrium for point formed market areas, there is a demonstration of how the ring system of agricultural locations varies in kind because of the non-linearity of rent space. This non-linearity of distance-rent follows from the variability of production cost per unit of commodity and of land, and which variability Dunn forceably proves to be the general case in space regardless of natural fertility conditions, equal or not. Also, the spatial non-linearity of rent is explained as the general result of such more obvious factors as concavity of the transport rate, multiplicity of products and processes, and multiplicity of point formed market centers. The book concludes essentially with an analysis of dynamic factors (change in demand and supply conditions) which may extend or shorten production radii, and which thereby cause further modifications to location patterns. These additions to general equilibrium theory and to the von Thünen system of rings make this book well worth reading.

Rollins College MELVIN L. GREENHUT

The Theory of Wages. By K. W. Rothschild. New York: Macmillan Co., 1955. Pp. viii, 178. $2.75.

This excellent little survey of the economic aspects of wage theory was written not only to bring together in manageable proportions some ideas on this vital subject but also to "impress on the reader . . . the relative character of all wage theory, which, more than many other branches of economic theory, is highly sensitive to changes in the social and economic environment" (p. 3).

Following a short summary of wage theories of the Physiocrats, Adam Smith, Ricardo, Mill, Marx, and the Marginalists, Rothschild divides the book into three parts: (1) "Wages Under Perfect Competition"; (2) "Wages in the Actual World"; (3) "Wages and the Community."

In part one, the usual analysis of the demand for and supply of labor is given. A chapter is devoted to hours of work where the point is made that it is less likely that hours of work will be reduced by sheer force of competition than it is that wages will be increased in this way. The shock of legislation, labor unions,

or public opinion is needed in this area. This part ends with a chapter on the problem of substitution of capital for labor—a chapter that is very pertinent to the current problem of automation.

Part two introduces the problems of frictions, monoplistic and monopsonistic competition, unions and bargaining power, wages and technical progress, wages and the trade cycle, and wages under full employment.

An analysis of minimum wage laws and wages in the national income is given in part three.

The author has succeeded in cramming a great deal of material into a small space, and he has accomplished this without sacrificing careful and sound analysis. Some readers will note omissions, e.g., his failure to emphasize the use of the wages-fund theory to support laissez-faire wage policies. But these omissions are minor. He has an excellent ability to reduce complex reasoning to clear and simple terms, although one is disturbed occasionally by such confusion as his failure to distinguish between pure and perfect competition.

The book is strongly Keynesian, and some readers will object to the author's apparent strong advocacy of economic planning (pp. 142–3, for example). The basis for the author's faith in economic planning by government is, to say the least, open to some questioning, but the space afforded by this book does not give him opportunity to explore his propositions fully. One could also object to this statement: "In short, because an employer derives the full benefit of a worker's output while he works for him but is not at all responsible for the upkeep of that man once he has become totally or partially incapable of producing, we have here one of the many situations where 'private costs' tend to diverge from 'social costs.' " The author should, at least, recognize America's Social Security Program and our non-contributory pension plans. A summary at the end of each chapter would aid the reader.

The little book is a valuable contribution to the field and should provide excellent material at least for supplementary reading in labor courses.

Finally, it provides a valuable contribution in calling attention in the last paragraph to the fact that "the purely economic theory of wages as expounded in this book represents only one aspect . . . of the entire wage problem. . . . A complete theory . . . will have to include the (social and political influences) and will break down the rather artificial barriers between economics and sociology."

Washington and Lee University E. C. GRIFFITH

Labor Mobility and Economic Opportunity. Essays by E. Wight Bakke and others. New York: John Wiley & Sons, 1954. Pp. vii, 118. $3.50.

This volume consists of seven essays which have as their aim the summarization of the results of several years of research activity and the presentation, directly or indirectly, of the thinking of the authors about crucial aspects of the operation of labor markets. It provides, then, a convenient means for the non-labor economist to obtain a bird's-eye view of the activities of a group of writers whose influence has been great in recent years. The term "non-labor economist"

is used because many of the ideas, data summaries, and data interpretations have been offered elsewhere in sources with which specialists in the field of labor are probably already familiar.

Professor Palmer's first essay has to do with adaptations which workers in a large metropolitan area make to various conditions of work availability over time. The data used were originally gathered (in 1936) for slightly different purposes; they were reworked with the aim of providing mobility results which could be compared with the results of later studies of different areas and different conditions of aggregate employment. Professor Myers' paper reports on two MIT studies of labor markets, one of which was made prior to, and the other, after, World War II. The first was concerned with the extent of employment, and the amount of, direction of, and incentives and obstacles to, mobility among firms. The second had to do with a group of newly unemployed workers and the procedures, information and incentives involved in their relocation. Professor Yoder's contribution summarizes the conclusions with respect to mobility which were drawn from the Minneapolis and St. Paul studies; its purpose is that of reporting findings as to characteristics of workers who changed jobs, their reasons for doing so, and the institutional factors involved. Among these studies there was considerable agreement with respect to the following: informal sources of information about job opportunities are most important to workers actively seeking employment; workers generally look first toward familiar job areas when they become unemployed—i.e., their preferences for new jobs are directly related to their experience and training; voluntary changes are fewer when job opportunities are scarce; younger males are most mobile. The extent of agreement is less clear-cut with respect to the extent of knowledge of job opportunities and the importance of wage rate differentials in stimulating job change.

Professor Myers states that much of the recent research activity in this area "grew out of a dissatisfaction with traditional assumptions of economic theory. . . ." In this connection, the cited studies are, of course, just a preliminary step: the hard work of using such data to test the "traditional" hypotheses is yet to be done. Meanwhile, these sorts of data are of value in that they increase our general "feeling" for the functioning of labor markets.

Professor Hauser's article, the longest of the group, is concerned with movement of workers into and out of the labor force. He presents a substantial amount of data relating to several aspects of this basic type of mobility, so his presentation is not amenable to hasty summary. Perhaps the following statements will provide an indication as to content. Secular changes: labor force participation rates in the U. S. have been fairly constant for 80 years, but participation of young and old workers has declined and that of women has increased. Cyclical changes: the data available are inadequate for testing hypotheses about the effect of changes in income and employment upon labor supply. Wartime changes: the responsiveness of labor supply to a variety of wartime stimuli can be great; World War II brought forth an "abnormal increment" of approximately 8 million workers, almost one-half of which were drawn from the 14–19 age bracket.

Seasonal changes: specific estimates of the quantitative importance of these changes has been one of the beneficial results of the establishment of the Monthly Report of the Labor Force; one estimate sugests a seasonal change of eight per cent. Gross changes: relatively stable labor force aggregates obscure the fact that large numbers of workers are constantly coming into and leaving the labor force; one source is quoted which points out that a one-month net change of about 200,000 workers was the effect of 2.4 million entrances into and 2.2 million exits from the labor force. Finally, working life data suggest a recent fundamental change in female work-patterns—a decline in female participation during the reproductive years followed by an increase during the 35–54 age span. Mr. Hauser points out the large gaps in the data describing labor force changes—and the larger and more fundamental inadequacies in our understanding of these phenomena.

Mr. Kerr's article, entitled "The Balkanization of Labor Markets," discusses the tendency toward the restriction of labor market activity by means of institutional rules controlling worker movement. He doubts that these rules have much effect upon the establishment of wage rates, but the effect upon the allocative function of the markets appear to him to be more certain. "It is debatable whether wage policies of unions and employers have much impact upon wage determination. It is not debatable that the institutional rules in the labor market do have substantial effects on the performance of our economic system. These rules increasingly affect both the opportunities held open to workers and the contributions which they can make to the national product" (p. 109).

This reviewer found Professor Palmer's second essay ("Epilogue: Social Values in Labor Mobility") confusing and only incidentally rewarding. Her points seemed to be that the relatively high degree of mobility of labor in this country is an important factor in explaining the ability of our economy to adjust to change and that it would be unfortunate if what seems to be secular decline in mobility continues toward the lower levels characteristic of many European nations. The confusing aspect of the article is that one can never feel quite sure what the "social values" are: in one place (p. 114) they seem to be identified with social goals (such as rising productivity) and in another (p. 116) they seem to be identified with worker attitudes (e.g., the willingness to take risks). There are some important ideas touched upon or implied in this article but they are not developed.

Mr. Bakke's introduction emphasizes the importance of a high degree of labor mobility to the maintenance of a free society.

University of North Carolina ROBERT L BUNTING

Essays in Economic History. Edited by E. M. Carus-Wilson for The Economic History Society. London: Edward Arnold, Ltd., 1954. Pp. viii, 438. $10.00.

The twenty-two essays in this volume are all reprints from the two principal journals devoted to economic history in England, *Economic History* (1926–41), a supplement to *The Economic Journal*, and the *Economic History Review*, founded in 1927. The quality of the individual selections is high, and the chronological and

topical coverage is well proportioned. There are five articles devoted to the Middle Ages, seven to the sixteenth and seventeenth centuries, four to the eighteenth, five to the nineteenth, and one which is not limited by dates. Population, technology, money and prices, agrarian and industrial organization, markets, public and corporate finance, and social questions are among the topics treated. A high proportion of the articles originally appeared in the *Economic History Review* as "Revisions in Economic History"; the merit of this innovation has been proved by the lasting significance of the articles which appeared under its rubric.

It is not surprising, owing to the nature of the volume, that most of the authors represented are British scholars. Earl Hamilton and John Nef (who is represented by two articles), both of the University of Chicago, are the only contributors not in this category. What is more significant is that so few of the articles deal with non-British topics. Two involve comparisons of England with France and the Netherlands, and two deal, respectively, with the "decline" (is there some subtle significance in this?) of Spain and the Netherlands. And of these four, two are by Professors Nef and Hamilton! The insularity of the typical Englishman is a well known national characteristic; but it is surprising—and revealing—that the economic historians of a country which, throughout the centuries, has been as dependent on international economic contacts as has England have been so little concerned with what took place across the waters. It may be true, as Sir Richard Pares states in his essay on "The Economic Factors in the History of Empire," that "the most important thing in the history of an empire is the history of its mother-country"—but one should not accept the word of an Englishman for it!

Comparisons are inevitable between this volume and one recently sponsored by the American Economic Association and the Economic History Association (*Enterprise and Secular Change: Readings in Economic History*, edited by Frederic C. Lane and Jelle C. Riemersma [1953]). The scope of the latter is broader in some respects, as it includes material on ancient as well as medieval and modern times, on several European countries and the United States, and essays on methodology as well as articles of factual content. At the same time, it does not deal with as large an array of topics as does the English volume. It includes contributors of several nationalities, but loses by reprinting articles of dubious merit and dated usefulness, whereas the selections in the volume under review are, with two or three possible exceptions, of undeniably high quality. Granted the slightly different objectives of the editors of each, it would appear that the English collection is more successful, and will probably be more useful—at least to students of English economic history.

University of Wisconsin RONDO E. CAMERON

PERSONNEL NOTES

Wilson Ashby has been promoted to associate professor of office administration at the University of Mississippi.

Kenneth Baize is instructor in economics at Southern Missionary College.

James A. Barnes, of Temple University, was visiting professor of economics and economic history at the University of Miami during the academic year of 1954–55.

Sam B. Barton, professor of economics at North Texas State College, is conducting a research project on the economic and social aspects of industrial injuries. This project was begun under a grant from the Research Council of North Texas State College and is being continued under a grant from the Hogg Foundation for Mental Hygiene.

Victor W. Bennett, professor of marketing and chairman of the Department of Marketing at the University of Miami, died in March 1955.

J. C. D. Blaine has been promoted to professor of transportation at the University of North Carolina. During the summer of 1955 he is doing research in the Caribbean area in regard to trade relations between that area and the United States.

Gladys Boone, professor of economics and chairman, Division of Social Sciences at Sweet Briar College, was on leave of absence during the second semester of 1954–1955 for work at the Institute of Industrial Relations, Berkeley, California.

Jess W. Brandon has been raised in rank to associate professor of accounting, effective in the autumn of 1955, in the School of Business Administration, University of Miami.

D. D. Brown resigned from the staff of the Agricultural Economics Department of North Carolina State College to accept a position with the Mutual Federation of Independent Cooperatives.

J. D. Butterworth, formerly of the staff of the University of Indiana, has been appointed associate professor of marketing at the University of Florida.

Dudley DeWitt Carroll, dean emeritus of the School of Commerce, University of North Carolina, has been promoted to Kenan professor of economics. He also was elected chairman of the Faculty Council.

Henry C. Chen has been appointed assistant professor of economics and finance in the College of Business Administration, University of Houston.

George W. Cubberly, who has been assistant to the dean of the School of Business Administration at the University of Miami, will return to full-time teaching duties in the autumn of 1955 as an instructor in marketing.

John C. Dawson, formerly a graduate student at Cornell University, was appointed instructor in economics at the University of Maryland last September.

Arch Richard Dooley has resigned his position as dean elect of the School of Business Administration of the University of North Carolina.

Frank Dunbaugh, of the School of Business Administration at the University of Miami, has been promoted to associate professor of marketing, effective in the autumn of 1955.

John E. Dykstra, professor of industrial management at the University of North Carolina, will be on assigned leave of absence during the coming academic year to participate in the Scott Paper Company's faculty fellowship program.

Mrs. Corwin D. Edwards was visiting lecturer in economics at Sweet Briar College during the second semester of 1954–1955.

William S. Engelson has been appointed instructor of economics at Mississippi Southern College.

Charles E. Ferguson, teaching fellow in economics at the University of North Carolina, has been awarded an H. B. Earhart fellowship for the year 1955–1956.

Clinton S. Ferguson has been promoted to assistant professor of economics at East Tennessee State College.

Amos W. Ford has been appointed professor of management at Louisiana Polytechnic Institute.

Dennis Ford, Jr., is on leave from the School of Business, West Texas State College, in order to do further graduate work at the University of Texas.

Paul P. Fulmer has been appointed instructor in business communications at Tulane University.

Irving J. Goffman, graduate student at Duke University, was appointed a half-time instructor in economics at North Carolina State College for the second semester, 1954–1955.

G. T. Gott has resigned from the economics staff of Southern Missionary College.

John G. Gurley, associate professor of economics at the University of Maryland, was granted leave to undertake research at the Brookings Institution in commercial banking in the United States.

Paul N. Guthrie has assumed the chairmanship of the Department of Economics at the University of North Carolina.

Daniel Hamberg, assistant professor of economics at the University of Maryland, participated in a Conference on Economic Development of Underdeveloped Areas that was held in Milan, Italy, October 10–15, 1954.

D. G. Harwood has joined the staff of the Agricultural Economics Department of North Carolina State College to work in farm management extension.

Milton S. Heath has been appointed chairman of Graduate Studies and Research in the areas of economics and business administration at the University of North Carolina.

William G. Heuson, of the School of Business Administration at the University of Miami, has been promoted to associate professor of finance, effective in the autumn of 1955.

Robert B. Highsaw has resigned as professor of public administration and chairman of the Department of Research in Business and Public Administration at the University of Mississippi to accept a position at the University of Alabama.

Henry A. Homme, formerly of Iowa State College, joined the staff of the Agricultural Economics Department of North Carolina State College on January 1, 1955 to teach and do research in the field of milk marketing.

Lee Johnson, chairman of the School of Business, West Texas State College, is scheduled to retire at the close of the 1955 summer session.

Maximilian B. Jones, graduate student at the University of North Carolina, was appointed instructor in economics at North Carolina State College for the second semester, 1954–1955.

L. R. Jordan, instructor in business administration at the University of North Carolina, has resigned to accept the position of business manager, Public Medical Clinic, Duke Hospital, Duke University.

Wylie Kilpatrick, research professor in the Bureau of Economics and Business Research, University of Florida, has been granted a leave of absence for six months to serve as fiscal consultant for the Northern Virginia Regional Commission.

Eloise Kimmelman, of the School of Business Administration at the University of Miami, has been raised in rank to associate professor of accounting, effective in the autumn of 1955.

Clayton P. Libeau, formerly of the University of Nebraska, joined the staff of the Department of Agricultural Economics at North Carolina State College on December 1, 1954 to do extension work in poultry marketing.

William Lord is on leave from the School of Business, West Texas State College, in order to do further graduate work at the University of Illinois.

Fritz Machlup, professor of economics at The Johns Hopkins University, is on leave of absence from February to the end of August to serve as visiting professor at Kyoto University and Doshisha University and as director of the Kyoto American Studies Seminar.

John P. Maggard has resigned his position as lecturer in business administration at the University of North Carolina to become assistant professor of marketing at the University of Tennessee.

Edwin Mansfield, of Duke University, has accepted a position as assistant professor at Carnegie Institute of Technology. He spent the 1954–1955 academic year at London University as a Fulbright scholar.

Henry E. Mattox has been appointed research assistant and instructor in economics at the University of Mississippi.

Joseph G. Mayton has resigned as professor of economics at the School of Business Administration, Atlanta Division, University of Georgia, to accept a position with Lockheed Aircraft Corporation.

R. G. Mizelle is instructor in economics at Southern Missionary College.

George Moss has returned to the University of Miami as assistant professor of accounting. He had been on the accounting staff at the University of San Francisco.

Eastin Nelson, professor of economics at the University of Texas, has been granted a leave of absence to serve as visiting professor of economics at the University of San Carlos, Guatemala City.

James M. Parrish, assistant dean in the School of Business Administration, University of North Carolina, has been promoted to assistant professor of economics.

Lloyd F. Pierce has been made director of the School of Business Administration and Economics at East Tennessee State College.

Andrew Warren Pierpont has been promoted to associate professor of business administration at the University of North Carolina.

James W. Price, local practicing attorney, is serving as part-time instructor in economics at the University of Mississippi.

Ralph L. Sackett, professor of marketing in the School of Business Administration at the University of Miami, has been appointed chairman of the Department of Marketing.

Alton G. Sadler, associate professor of accounting at the University of North Carolina, will spend a part of the summer of 1955 under a faculty fellowship residence program with Price Waterhouse & Company at their home office in New York.

Frank J. Schwenkter, Julian Price lecturer in life insurance in the University of North Carolina School of Business Administration, has been elected a fellow of the American Society of Insurance Research.

A. D. Seale, Jr., joined the staff of the Agricultural Economics Department of North Carolina State College January 1, 1955 to do extension work in the field of milk marketing. He was formerly employed by the USDA and North Carolina State College and was working in fruit and vegetable marketing research.

Alfred G. Smith, Jr., has been promoted to professor of economics at the University of South Carolina.

F. DeVere Smith has been promoted to professor of economics at the University of South Carolina.

R. Elberton Smith, formerly at the University of Chicago, was appointed lecturer in economics last September at the University of Maryland.

Spencer M. Smith, assistant professor of economics at the University of Maryland, represented the University of Maryland at the Maryland Economic Workshop held at Goucher College last August.

Walter Allen Spivey, part-time instructor in economics at the University of North Carolina, has been awarded an H. B. Earhart fellowship for the year 1955–1956.

Harry Stark, of the School of Business Administration at the University of Miami, has been promoted to assistant professor of economics, effective in the autumn of 1955.

W. Paul Strassman was appointed instructor in economics at the University of Maryland last February and has been awarded a Social Science Research Grant for 1955–1956.

Floyd Swann has been appointed instructor in the Management Department at the University of Miami, effective in the autumn of 1955.

William A. Terrill has been promoted to associate professor of accounting at the University of North Carolina.

Robert H. Tucker, dean emeritus of Washington and Lee University, is serving as an economic consultant for the Virginia Department of Highways.

Glenn Tussey joined the staff of the Agricultural Economics Department of North Carolina State College to work in the field of cotton marketing extension. He was formerly employed by the USDA.

Arthur Vandenburg, Jr., after having been on leave for eight months, has returned to the University of Miami as a visiting lecturer in government and political science.

Harry I. Warner, of the School of Business Administration at the University of Miami, has been raised to the rank of assistant professor of accounting, effective in the autumn of 1955.

Barton A. Westerlund, assistant professor of marketing and business statistics in the School of Business Administration at the University of Miami, was granted a leave of absence for the second semester of 1954–1955 to serve as research assistant with the Gulf and Carribean Fisheries Institute of the University of Miami.

William L. Wilbur is assistant professor of economics at Memphis State College. By error he was listed in the April, 1955 issue of this Journal as being an instructor.

Alvin B. Wooten has resigned as acting assistant professor of economics at Texas A. & M. College to take a position with the Texas Agricultural Extension Service.

Leland B. Yeager, instructor in economics at the University of Maryland, rejoined the faculty after a year's leave of absence during which time he taught in the European Program of the University of Maryland.

BOOKS RECEIVED

Approaches to Economic Development. By Norman S. Buchanan and Howard S. Ellis. New York: Twentieth Century Fund, 1955. Pp. xiv, 494. $5.00.

Personnel Relations: The Human Aspects of Administration. By Arthur M. Whitehill. New York: McGraw-Hill Book Co., 1955. Pp. xi, 526. $6.00.

A Study of the Factors Determining the Exercise of Jurisdiction by the National Labor Relations Board in Three Selected Industries. By Algernon S. Belcher. Washington, D. C.: Catholic University of America Press, 1954, Pp. xii, 62. Paper, 75¢.

Inter-Industry Labor Mobility: The Case of the Displaced Textile Worker. By William H. Miernyk. Boston, Mass.: Bureau of Business and Economic Research, Northeastern University, 1955. Pp. vii, 158. $2.75.

What Price Federal Reclamation? By Raymond Moley. Washington, D. C.: American Enterprise Association, 1955. Pp. vii, 72. Paper, $1.00.

Business and Economic Forecasting: Tools in Making Business Decisions. Report of the Committee on Economic Policy. Washington, D. C.: Chamber of Commerce of the United States, 1954. Pp. iv, 30. Paper, 50¢.

The TVA: An Approach to the Development of a Region. By Gordon R. Clapp. Chicago, Ill.: University of Chicago Press, 1955. Pp. xiii, 206. $3.50.

The Theory of Interest: As Determined by Impatience to Spend Income and Opportunity to Invest It. By Irving Fisher. New York: Kelley & Millman, 1954. Pp. xxvii, 566. $8.50.

Competitive Economic Systems. By George P. Adams, Jr. New York: Thomas Y. Crowell Co., 1955. Pp. xii, 516. $6.00.

Economic Handbook: A Visual Survey. By Charles B. Fowler and others. New York: Thomas Y. Crowell Co., 1955. Pp. ix, 246. Paper, $2.45.

Income in Kentucky: County Distributions by Amount, by Type, and by Size. By John L. Johnson. Lexington, Ky.: University of Kentucky Press, 1955. Pp. xx, 310. $4.50.

The Theory of Wages. By K. W. Rothschild. New York: Macmillan Co., 1954. Pp. viii, 178. $2.75.

The Ownership of Tax-Exempt Securities, 1913–1953. By George E. Lent. New York: National Bureau of Economic Research, 1955. Pp. x, 140. Paper, $1.50.

Marketing Farm Products: Economic Analysis. By Geoffrey S. Shepherd. 3rd ed. Ames, Iowa: Iowa State College Press, 1955. Pp. x, 497. $6.25.

Money, Banking and the Financial System. By Milton L. Stokes and Carl T. Arlt. New York: Ronald Press Co., 1955. Pp. vi, 670. $6.00.

Short-Term Economic Forecasting: Studies in Income and Wealth. By The Conference on Research in Income and Wealth. Vol. 17. Princeton, N. J.: Princeton University Press, 1955. Pp. xi, 506. $7.50.

Economics and the Public Interest. Edited by Robert A. Solo. New Brunswick, N. J.: Rutgers University Press, 1955. Pp. xiv, 318. $5.75.

An Economic Survey Method for Small Areas. By Alfred G. Dale. Austin, Texas: Bureau of Business Research, University of Texas, 1955. Pp. 47. Paper, $2.00.

A Study of Saving in the United States: Introduction; Tables of Annual Estimates of Saving, 1897 to 1949. By Raymond W. Goldsmith. Vol. I. Princeton, N. J.: Princeton University Press, 1955. Pp. xxx, 1138.

A Study of Saving in the United States: Nature and Derivation of Annual Estimates of Saving, 1897 to 1949. By Raymond W. Goldsmith. Vol. II. Princeton, N. J.: Princeton University Press, 1955. Pp. xxiv, 632. Both Vols. $30.00.

Business Budgeting and Control. By J. Brooks Heckert and James D. Willson. 2nd ed. New York: Ronald Press Company, 1955. Pp. vi, 441. $6.75.

Protective Labor Legislation and Its Administration in Tennessee. By J. Fred Holly and Bevars D. Mabry. Knoxville, Tenn.: University of Tennessee Press, 1955. Pp. 216.

Henry George. By Charles Albro Barker. New York: Oxford University Press, 1955. Pp. xvii, 696. $9.50.

The Union and the Coal Industry. By Morton S. Baratz. New Haven, Conn.: Yale University Press, 1955. Pp. xvii, 170. $3.75.

Foreign Capital in Latin America. UN pub. 1954. II.G. 4. New York: Columbia University Press, 1955. Pp. vii, 164, Paper, $1.75.

Caribbean Tourist Trade Index: A Comprehensive Study of Tourist Trends in the Caribbean for the Past Six Years. By Reinhold P. Wolff and Oscar Marcenaro. Coral Gables, Fla: Bureau of Business and Economic Research, University of Miami, 1955. Pp. 11. Paper, $2.00.

Reconstruction of Economics: Including Papers by Dr. May Brodbeck and Dr. Richard S. Rudner. By E. C. Harwood. Great Barrington, Mass.: American Institute for Economic Research, 1955. Pp. 112. Paper, $1.00.

Fundamental Accounting Principles. By William W. Pyle. Homewood, Ill.: Richard D. Irwin, Inc., 1955. Pp. xvii, 808. $6.00.

Policy Formulation and Administration: A Casebook of Top-Management Problems in Business. By George Albert Smith, Jr., and C. Roland Christensen. Rev. ed. Homewood, Ill.: Richard D. Irwin, Inc., 1955. Pp. x, 749. $6.00.

Practical Distribution Cost Analysis. By Donald R. Longman and Michael Schiff. Homewood, Ill.: Richard D. Irwin, 1955. Pp. xii, 450. $6.50.

Economic Change in Thailand Since 1850. By James C. Ingram. Stanford, Calif.: Stanford University Press, 1955. Pp. vii, 264. $5.00.

Economic Geography. By Samuel Newton Dicken. Boston: Heath and Co., 1955. Pp. ix, 569. $6.50.

Soviet Civilization. By Corliss Lamont. 2nd ed. New York: Philosophical Library, 1955. Pp. xxx, 447. $5.00.

The Works and Correspondence of David Ricardo. Edited by Piero Sraffa and M. H. Dobb. Vol. X. New York: Cambridge University Press, 1955. Pp. x, 424. $4.75.

Current Introductory Economics. By Paul F. Getamill. New York: Harper & Brothers, 1955. Pp. xii, 711. $5.50.

Personnel and Industrial Psychology. By Edwin E. Ghiselli and Clarence W. Brown, 2nd ed. New York: McGraw-Hill Book Co., 1955. Pp. ix, 492. $6.00.

Free Trade and Protection in the Netherlands, 1816–30: A Study of the First Benelux. By. H. R. C. Wright. New York: Cambridge University Press, 1955. Pp. x, 251. $6.00.

Real Estate Principles. By Henry E. Hoagland. 3rd ed. New York: McGraw-Hill Book Co., 1955. Pp. xii, 538. $6.50.

The Irish Pound, 1797–1826: A Reprint of the Report of the Committee of 1804 of the British House of Commons on the Condition of the Irish Currency with Selections from the Minutes of Evidence Presented to the Committee. By Frank Whitson Fetter. Evanston, Ill.: Northwestern University Press, 1955. Pp. 136. $3.00.

Economic History of the United States. By Howard R. Smith. New York: Ronald Press Co., 1955. Pp. x, 763, $6.00.

Economic Planning Under Free Enterprise. By Henry Grayson. Washington, D. C.: Public Affairs Press, 1955. Pp. x, 134. Paper, $2.00.

The Economics of Group Banking. By Palmer T. Hogenson. Washington, D. C.: Public Affairs Press, 1955. Pp. vii, 199, $5.00.

Gateway to the Social Sciences. By Arthur W. Thompson. New York: Henry Holt and Co., 1955. Pp. viii, 374. Paper, $2.90.

The Stamp Memorial Lecture, 1954: Wages. By Sir Dennis Robertson. London: Athlone Press, 1955. Pp. 18. Paper, 50¢.

The Stamp Memorial Lecture, 1951: The Balance of Payments. By Lionel Robbins. London: Athlone Press, 1951. Pp. 32. Paper, 50¢.

Commuting Patterns of Industrial Workers: A Study of Experience Since 1940 in the Northeast Region. By Leonard P. Adams and Thomas W. Mackesey. Ithaca, N. Y.: Housing Research Center, Cornell University, 1955. Pp. iv, 135. Paper, $2.00.

Introduction to International Trade and Finance. By Lorie Tarshis. New York: John Wiley & Sons, 1955. Pp. x, 536. $6.00.

Twenty-Sixth Boston Conference on Distribution, 1954. A National Forum for Problems of Distribution. Boston, Mass.: Retail Trade Board, 1954. Pp. 104. Paper, $4.00.

Three Taft-Hartley Issues: I. Secondary Boycotts, II. "Mandatory" Injunctions, III. Replaced Strikers' Votes. By Theodore R. Iserman. Washington, D. C.: American Enterprise Association, 1955. Pp. 32. Paper, $1.00.

Community Relations in Texas Industry. By Stanley A. Arbingast and others. Austin, Texas: Bureau of Business Research, University of Texas, 1955. Pp. vii, 100. Paper, $1.00.

Economics and Liberalism: Collected Papers. By O. H. Taylor. Cambridge, Mass.: Harvard University Press, 1955. Pp. 321. $5.00.

Business Concentration and Price Policy: A Conference of the Universities-National Bureau Committee for Economic Research. A Report of the National Bureau of Economic Research, New York. Princeton, N. J.: Princeton University Press, 1955. Pp. x, 514. $9.00.

TVA: Dividends to the Nation. Tennessee Valley Authority's Annual Report to

the Congress for the Fiscal Year ended June 30, 1954. Washington, D. C.: U. S. Government Printing Office, 1955. Pp. iv, 69.

Institutional Changes in the Postwar Economy of Poland. By W. J. Stankiewicz and J. M. Montias. New York: Mid-European Studies Center Free Europe Committee, 1955. Pp. 125. Paper, $1.00.

Economics and Action. By Pierre Mendes-France and Gabriel Ardant. UNESCO Publication. New York: Columbia University Press, 1955. Pp. 222. $3.50.

States Rights and the Law of Labor Relations. By Gerard D. Reilly. Washington, D. C.: American Enterprise Association, 1955. Pp. 35. Paper, $1.00.

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